

1400 FD SERVICE MANUAL



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TABLE OF CONTENTS

FOREWORD	
SPECIFICATIONS	1
COIN SYSTEM	1
ELECTRICAL SYSTEM	1
ELECTRICAL SEQUENCE OF OPERATION	2
PROGRAM TIMER	9
How to Adjust the Cams of the Program Timer	14
CUP SYSTEM	15
Cup Magazine	15
Adjustments	17
Changing to a 9 oz. Cup	17
Lisern Cup Drop Separator	20
Adjusting the Stopping Point	20
WATER SYSTEM	21
Water Intake System	21
Filling the Hot Water Tank	21
Heating the Water in the Hot Water Tank	21
Low Water Heater Control Switch	22
Low Water C.R.E.M. Control Switch	22
Water Outlet System	22
Schematic of Water System	23
Other Features	24
COMMODITY SYSTEM	24
Canisters	25
Chocolate Homogenizer	25
Humidity Bar	25
STEAM EXHAUST SYSTEM	25

SERVICE MANUAL

RMI 1400 FD

FOREWORD

The RMI 1400 Freeze Dry Coffee Dispenser was developed to meet a growing need for an intermediate simple operating and easily maintained freeze dry coffee dispensing machine.

The unit is completely self contained and has a capacity of 850 - 7 oz. cups. It will also dispense hot chocolate, tea, Sanka and soup in addition to freeze dry coffee. The specifications and operating functions are listed on the following pages.

SPECIFICATIONS

Dimensions - 72" High (including 6" legs)
 27" Deep
 32" Wide

Weight - 450 lbs.

Capacity - 850 Cups (7 oz.)

Freeze Dry Coffee	3 lbs.
Creme	4 lbs.
Sugar	11 lbs.
Chocolate	14 lbs.
Soup	3 lbs.
Tea	1 lb.
Sanka	2 lbs.

No. of Drinks

900 @	1.5 gms.
908 @	2 gms.
832 @	6 gms.
254 @	25 gms.
227 @	6 gms.
252 @	1.8 gms.
600 @	1.5 gms.

Electrical - 120 Volts AC, 60 HZ, 15 AMPS

THE COIN SYSTEM

The RMI 1400 FD is designed to accept all single price coin acceptor mechanisms (110 volts) presently in use on cup drink vending equipment.

The coin insert bezel has been placed high for the user's convenience. The coin return plunger is located in a manner to prevent physical abuse without restricting its intended use. The internal linkage between the return plunger and the acceptor is rugged and direct. Coin guides inside the door are easily removed if necessary for cleaning. The coin box is located under the coin changer and may be secured with a padlock.

In the event that multiple pricing is required, a kit is available to use in conjunction with a MULTI-PRICED CHANGER.

THE ELECTRICAL SYSTEM

The present production models of the RMI 1400 FD are assembled with a handwired electrical box. It utilizes the same relays and switches as in the RMI 850 "Single Cuppers".

Just a word about nomenclature. Some confusion seems to exist in the description of electrical circuits, especially with regard to relays. The relays used in the Rmi 1400 FD models are all of the same type. They are plug-in triple pole, double throw units which are fully interchangeable. They have only two positions depending on whether or not they are powered. When a relay has been energized, the contacts close. Translation: when the coil of the relay has been powered, the moveable contacts are drawn toward the coil and the ones designated as normally open (N.O.) are closed. Likewise, when the relay is de-energized, the terminal contacts all return to their normally closed position (N.C.). This terminology is used throughout this description to indicate the relay position.

ELECTRICAL SEQUENCE OF OPERATION

When the power cord has been plugged into the proper source of electricity, power will flow into the hot leg to the 15 ampere circuit breaker. A branch line serves the utility lamp and its switch. The utility lamp switch is operated by the cabinet door and will light even if the circuit breaker is open.

A power switch will open both sides of the line. When it is closed, power is available to supply the water heater in the hot water tank. This heating element will not receive power until the water level is up and the float switches are closed (see Water System). When the power is on, the display lamps will be lighted, the exhaust fan will run and the water heating elements will operate according to the demand of the thermostat.

There is one safety overflow switch in the liquid waste pail. The safety switch is operated in the normally open position by the weight of

a float, providing power to point (A) in the circuit descriptions. This float will rise if an excessive amount of water is accumulated in the waste pail and open a circuit to prevent any further operation of the machine.

FOLLOWING IS AN EXPLANATION OF THE VARIOUS CIRCUITS FROM THE TIME A COIN IS INSERTED UNTIL THE COMPLETION OF THE CYCLE WHICH WILL INCLUDE THE DISPENSING OF A CUP AND THE VARIOUS INGREDIENTS DEPENDING ON THE PARTICULAR SELECTION.

1. COIN CREDIT ESTABLISHED

An integral part of the coin credit circuit is the "CUP SOLD OUT" switch. This switch is held operated by the presence of cups in the throat of the cup dispenser. Power from the "common" of the "CUP SOLD OUT" switch through the "operated contacts" of the "CUP SOLD OUT" switch, contacts 8 & 2 of K-2 (Vend Relay), contacts 9 & 3 of K-1 (Coin Relay) and the contacts of the Lo-Level water switch will energize the Coin Return Electromagnet (C.R.E.M.) of the coin acceptor. When the C.R.E.M. is energized, coins will be accepted by the coin mechanism.

Coins equal to the purchase price will pass through the acceptor and trip the coin switch of the coin mechanism. The passing of the coin is momentary and coin switch will return to its normal position. The momentary operation of the coin switch provides an electrical impulse to K-1 (Coin Relay) causing it to be energized.

Relay K-1 is locked closed by the power from the common of the "CUP SOLD OUT" switch through the N.C. contacts 8 & 2 of K-2 (Vend Relay)

and through K-1's own N.O. contacts 9 & 6. K-1 provides the power to the Selector Switch from the normally closed contacts of the Vend Switch and through the N.O. contacts 8 & 5 of K-1 (Coin Relay).

When a selection has been made, the selection relay and K-2 (Vend Relay) will be energized. When this happens, K-1 (Coin Relay) will immediately be de-energized. This removes the power from the Selector Switch circuitry.

2. CUP DISPENSER CIRCUIT

Whenever a selection is made, the cup dispenser must operate to drop a cup and receive the beverage selected. Current flows through the vend switch (normally closed contacts) to relay K-2 contacts 7 & 4, and to the Cup Pulse switch (15) of the program timer. When switch (15) is closed, a short pulse is sent to the counter and to the cup dispenser motor. When the Cup Dispenser Motor rotates, its switch, (1) of the Program Timer, completes a circuit which allows the motor to complete one revolution even though the short cup motor pulse has been removed by the action of switch (15). (SEE CUP SECTION). The cup dispenser motor stops at the end of its cycle.

The spiral motor switch, which by-passes switch (15), will operate the cup spiral motor during the vend cycle when the cups have dropped below the spiral motor switch in the throat of the cup dispenser. The spiral motor will advance the next column of cups into the dispenser. (SEE CUP SECTION).

3. SELECTION IS MADE FOR BLACK COFFEE

When the customer presses the Black Coffee button, power will flow from the common of the coffee switch and energize Relay K-3 (Coffee Relay).

Once energized, K-3 seals through its own contacts 9 & 6, N.C. contacts 7 & 1 of K-7 (Tea Relay), N.C. contacts 9 & 1 of K-9 (Sanka Relay), and the Relay Lock switch (14) of the Program timer. When K-3 is energized, a circuit is completed from the Cut-Off switch of the program Timer through contacts 8 & 5 of K-3 to energize K-2 (Vend Relay). The Vend Relay seals through its own contacts 9 & 6 and the Relay Lock switch (14) of the Program Timer.

The Coffee Auger Motor is energized by the Coffee Auger switch (9) on the Program Timer through contacts 9 & 6 of K-3 Relay and the Relay Lock switch (14) on the Program Timer. The same circuit that starts the Coffee Auger Motor supplies power to the Coffee Water switch (13) on the Program Timer through contacts 1 & 4 of K-3 Relay and contacts 2 & 10 of K-9 (Sanka Relay). Note: Coffee water, Tea water and Sanka water are controlled by the same switch (13) on the Program Timer.

K-3 and K-2 relays will remain energized until the Relay Lock switch (14) cam on the rotating program timer shaft momentarily trips the Relays Lock switch. The tripping the Relay Lock switch (14) de-energizes all Relays. This applies for all selections.

4. SELECTION OF COFFEE WITH CREME (LIGHT)

When the coffee light button is pushed, power will flow directly from the common of the Creme switch to Relay K-4 (Creme relay). K-4 is held closed through its own contacts 9 & 6 and the Relay Lock switch (14) of the Program Timer. When K-4 is energized, power is fed through contact 7 & 4 of K-4, contacts 1 & 9 of K-9 (Sanka relay), contacts 1 & 7 of K-7 (Tea relay) to the Coffee relay K-3. The Vend relay in turn will be energized by contacts 8 & 5 of K-4 (Creme relay).

NOTE: CONTACTS 8 & 5 OF ANY PRODUCT RELAY WILL ENERGIZE RELAY K-2 (VEND RELAY).

When K-2 is energized, the Coffee Auger will be controlled through the Coffee Auger switch (9) of the Program Timer and the water will be controlled by the Water switch (13). When the Creme switch (2) of the Program Timer is closed by its cams, voltage is applied to the Creme Dispensing motor, releasing the amount of creme that the cams have been set to deliver.

Extra creme for the selection is obtained by holding the Extra Creme selection switch during the dispensing cycle. The circuit for this selection is fed through contacts 1 & 7 of K-6 (Chocolate relay), 1 & 7 of K-8 (Soup relay), Extra Creme (6) of the Program Timer and the Extra Creme selection switch on the door to the Creme Dispensing motor.

5. SELECTION OF COFFEE WITH SUGAR

When the Coffee with Sugar button is pushed, power will flow directly from the common of the Sugar Button switch to relay K-5 (Sugar relay). K-5 is held closed through its own contacts 9 & 6 and the Relay Lock switch (14) of the Program Timer. When K-5 is energized power is fed through contacts 7 & 4 of K-5 (Sugar relay), contacts 1 & 9 of K-9 (Sanka relay), 1 & 7 of K-7 (Tea relay) to the Coffee relay K-3. The Vend relay K-2 will be energized by contacts 8 & 5 of K-5 (Sugar relay).

When K-3 is energized, the coffee will be controlled through the Coffee Auger switch (9) and the water will be controlled by switch (13) as in the Black Coffee cycle.

Extra sugar for this selection is obtained by holding the Extra Sugar selection switch during the dispensing cycle. The circuit for the

selection is fed through contacts 1 & 7 of K-6 (Chocolate relay), contacts 1 & 7 of K-8 (Soup relay), Extra Sugar switch (7) of the Program Timer and the Extra Sugar selection switch on the door to the Sugar Dispensing motor.

6. SELECTION OF COFFEE WITH CREME (LIGHT) AND SUGAR

When the Creme and Sugar button is pressed, power is applied to K-4 (Creme relay) and K-5 (Sugar relay). Each relay is held closed by a holding circuit from the Relay Lock switch (14) of the Program Timer through contacts 9 & 9 of their respective relays.

The Coffee relay K-3 will be energized through the contacts 7 & 4 of K-4 (or of K-5), contacts 1 & 9 of K-9 (Sanka relay) and contacts 1 & 7 of K-7 (Tea relay). As in the other selections, the Vend relay, K-2 will be energized through the contacts 8 & 5 of the Product relays.

Coffee and water will be dispensed through their corresponding switches (9) and (13) of the Program Timer. Extra Creme and Sugar will be dispensed by holding the Extra Creme and Sugar selection buttons on the door through same circuits as two previous selections.

7. SELECTION OF CHOCOLATE

When Chocolate selection switch is pushed, the Chocolate relay K-6 will be energized and held closed by current passing through contacts 9 & 6 of K-6 (Chocolate relay), normally closed contacts 9 & 3 of K-3 (Coffee relay), and the Relay Lock switch (14) of the Program Timer.

Cams on the Program Timer shaft operate the Chocolate switch (4) and the Chocolate Water switch (5). Switch (4) operates the Chocolate Dispensing motor and switch (5) controls the Chocolate Water valve and the Chocolate Whipper motor. Creme cannot be dispensed because contacts

1 & 7 of K-6 are open during the Chocolate cycle.

8. SELECTION OF TEA

When the Tea selection switch is pushed, the Tea relay K-7 will be energized and will be held closed by current passing through contacts 9 & 6 of K-7 (Tea relay), contacts 9 & 3 of K-3 (Coffee relay) and the Relay Lock switch (14) of the Program Timer. K-2 (Vend relay) is energized through contact 8 & 5 of K-7 (Tea relay) and held closed through its contacts 9 & 6 and the Relay Lock switch of the Program Timer.

The Program Timer motor is energized by K-2, and the cams on the timer rotating shaft will operate the Tea switch (12) and the Tea Water switch (13) on the Program Timer. The switches provide voltage to the Tea ingredient dispensing motor and the Tea Water outlet valve. As noted before, the Tea Water valve and the Coffee valve are one and the same.

Creme or Sugar for tea is obtained by holding the Extra Creme and Sugar buttons on the door during the dispensing cycle. Refer to Coffe/Light and Coffee/Sugar descriptions for the Extra Creme and Extra Sugar circuits.

9. SELECTION OF SANKA

When the Sanka selection is pushed, the Sanka relay K-9 is energized and held closed by the circuit through contacts 12 & 8 of K-9 (Sanka relay), contacts 9 & 3 of K-8 (Soup relay), contacts 9 & 3 of K-7 (Tea relay), contacts 9 & 3 of K-6 (Chocolate relay), contacts 9 & 3 of K-3 (Coffee relay) and the Relay Lock switch (14) of the Program Timer. The K-2 relay (Vend relay) is energized through 11 & 7 of K-9 (Sanka relay).

The Program Timer motor is energized by K-2 (Vend relay). The cams on the timer rotating shaft will operate the Sanka switch (8) and the

Sanka Water switch (13) on the Program Timer. The switches provide voltage to the Sanka ingredient dispensing motor and the Sanka Water outlet valve. (Same as Coffee and Tea Water valve).

Creme and Sugar for Sanka are obtained by depressing and holding the Extra Creme and Sugar buttons. Circuitry is same as Extra Creme and Sugar for coffee selections.

10. SELECTION OF SOUP

When the Soup selection is pushed, the Soup relay K-8 is energized and held closed by the current through contacts 9 & 6 of k-8 (Soup relay), contacts 9 & 3 of K-7 (Tea relay), contacts 9 & 3 of K-6 (Chocolate relay), normally closed contacts 9 & 3 of K-3 (Coffee relay), and the Relay Lock switch (14) of the Program Timer.

K-2 (Vend relay) is energized by power through the cut-off switch (1) on the Program Timer and contacts 8 & 5 of K-8 (Soup relay). The locking circuit of K-2 will hold K-2 energized which will allow the Program Timer to operate. The cams on the rotating timer shaft will operate the Soup switch (10) and the Soup Water switch (11), and provide voltage to the Soup Dispensing motor and the Soup Water outlet valve.

PROGRAM TIMER

The Program Timer is the heart of the operation of the RMI 1400 FD. This timer is located within the electrical box. It has 15 cam sets on a single shaft driven by a synchronous motor.

When a coin is inserted and you push a selection, a pulse is sent to the Program Timer motor to start its operation. As the shaft turns, all cam sets turn and operate their respective switches.

Cam sets consist of a Black and a White plastic cam.

The Black half of a set will operate its switch at the proper time in the cycle to begin the action for which it is responsible. This cam is factory set and normally never need be adjusted. The Black cam controls "when" products or liquid is released. This timing is important from the viewpoint of getting dry products in a running stream of liquid, or getting the liquid running toward the cup in the shortest possible time after a selection has been activated.

The White cam controls the total time of release of any specific ingredient during a cycle. Since the delivery rate of either dry products or liquids is constant from start to finish, the amount is determined by how long the delivery is made. The White cam controls "how much" by regulating the duration of the delivery.

All product switches (Coffee, Creme, Sugar, Tea, Sanka, Chocolate and Soup) are closed when the switch goes in the valley of the cam. All water switches are closed when the switch arm rides on the high side of the cam. The cam switch assemblies have the following functions starting from the motor end (left to right).

1. CUT-OFF - This has a three-fold function:
 - a. It supplies voltage for all the holding circuits of the product relays (Coffee, Tea, Sanka, Sugar, Creme, Chocolate and Soup).
 - b. It allows the Program Timer motor to complete one full cycle when the switch is on the high side of the cam.
 - c. It also provides power to the cup pulse switch (15) when the switch arm is on the high side of the cam.

2. CREME - This switch controls the amount of Coffee Creme dispensed when the switch arm is in the valley of the cam. The amount of creme can be decreased by turning the White cam downward and increased by turning the White cam upward. Downward decreases the valley and upward increases the valley of the cam.
3. SUGAR - This switch controls the amount of Coffee Sugar dispensed when the switch arm is in the valley of the cam. The amount of sugar can be decreased by turning the White cam downwards and can be increased by turning the White cam upwards. REMEMBER - downward decreases the valley, and upward increases the valley of the cam.
4. CHOCOLATE - This switch determines the amount of chocolate dispensed. Chocolate can be increased by turning the White cam upwards and decreased by turning the White cam downward. It is controlled by the valley of the cam.
5. CHOCOLATE WATER AND WHIPPER - The amount of liquid dispensed is controlled by the high side of the cam. To increase the amount of water dispensed, turn the White cam upward. To decrease the amount of water, turn the White cam downward. The chocolate whipper will run during the dispensing of the water.
6. EXTRA CREME - This switch has a dual function. When coffee is selected and the extra creme button is depressed, additional creme will be dispensed. The amount is determined by allowing the extra creme switch arm to remain longer in the valley than the switch arm of the Creme switch (2). Make sure that the Extra Creme White cam is higher than the Creme White cam. When Sanka or Tea is selected,

the amount of creme for Sanka or Tea will be determined by the length of the valley from the Black to the White cam. If more Sanka or Tea is required, increase the valley of the cams by turning the Black cam downwards.

7. EXTRA SUGAR - This switch has a dual function - the same as the Extra Creme switch. When coffee is selected and the Extra Sugar button is depressed, additional sugar will be dispensed. The amount is determined by allowing the Extra Sugar switch arm to remain longer in the valley than the switch arm of the Sugar switch (3). Make sure that the Extra Sugar White cam is higher than the Sugar White cam. The amount of sugar for Sanka or Tea will be determined by the length of the valley from the Black cam to the White cam. If more Tea or Sanka Sugar is required, increase the valley of the cams by turning the Black cam downwards.
8. SANKA - This switch determines the amount of Sanka dispensed. The switch is controlled by the switch arm in the valley. To increase the amount of Sanka, turn the White cam upward and to decrease the amount of Sanka, turn the White cam downward.
9. COFFEE - This switch determines the amount of Freeze Dry Coffee dispensed. The switch is controlled by the switch arm in the valley. To increase the amount of coffee, turn the White cam upward and to decrease the amount of coffee, turn the White cam downward.
10. SOUP - This switch determines the amount of soup dispensed. The switch is controlled by the switch arm in the valley. To increase the amount of soup, turn the White cam upward and to decrease the amount of soup, turn the White cam downward.

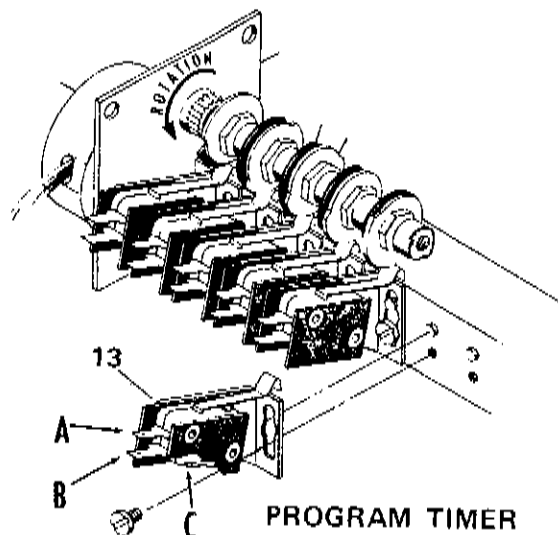
11. SOUP WATER - This switch determines the amount of soup water dispensed. The switch is controlled by the high side of the cam. To increase the amount of liquid, turn the White cam upward. To decrease the amount of liquid, turn the White cam downward.
12. TEA - This switch determines the amount of the tea dispensed. The switch is controlled by the switch arm in the valley. To increase the amount of tea, turn the White cam upward and to decrease the amount of tea, turn the White cam downward.
13. COFFEE, TEA AND SANKA WATER - This switch determines the amount of liquid for Coffee, Tea and Sanka. The switch is controlled by the high side of the cams. To increase the amount of liquid, turn the White cam upward. To decrease, turn the White cam downward.
14. RELAY LOCK - This switch is the holding circuit to all relays. All relays that have been energized will remain closed until the end of the cycle. The opening of the Relay Lock switch will de-energize the coils of all the relays that had been energized and the relays will open.
15. CUP PULSE - The Cup Pulse switch has a two-fold purpose. The cam is set to close the switch momentarily at the beginning of the Program Timer cycle. The switch applies voltage to both the counter and the cup dispenser motor through its holding switch. The Cup Pulse switch cam should have a short valley. If two cups are dispensed in succession during the cycle, close the valley of the cam, which will eliminate the power to the cup dispenser motor sooner.

IMPORTANT

1. DO NOT TOUCH THE BLACK CAM ON THE RELAY LOCK CAM SET.
2. On product and relay lock cams, the valley of the cam controls the switch. On all water cams the high side of the cam controls the switch. The Black cams on the product cam sets should not be changed unless it is necessary to allow the product to be dispensed later than pre-set in order to dispense the powdered product into the flow of the water so that the product is not dispensed into a dry trough.

HOW TO ADJUST THE CAMS OF THE PROGRAM TIMER

This program timer is adjusted with the two small cam wrenches shipped with the unit.



First of all, do not move the Black cam position unless you desire to change the starting point of a commodity release. The Black cams have all been carefully set to start the release of each beverage

component at the correct time. Releasing dry ingredients into a dry trough and then adding water will not produce a quality beverage and will lead to gummy mixing chambers.

To change the volume or weight of the released product, proceed as follows:

1. Remove the electrical box cover.
2. Place one of the wrenches on the metal hex nut adjacent to the motor gear to prevent movement of the shaft.
3. Place the second wrench on the hex area of the White cam to be adjusted.
4. Move the White cam to effect the desired change.

To increase the liquid or product, move the White cam upward. To decrease the amount required, move the White cam downward.

THE CUP SYSTEM

Every beverage sold through the RMi 1400 Freeze Dry requires a clean, disposable cup. Inside the machine is a storage area for a large number of cups, and device called a cup separator to dispense a single cup for each cycle of the machine. Included in the cup system is a "sold out" switch, which will light the sold out lamp when there are no cups available to dispense and will de-energize the Coin Return Electromagnet (C.R.E.M.). The C.R.E.M. will return the coins in the event of a failure.

THE CUP MAGAZINE

The storage system on the RMi 1400 Freeze Dry is unique. Cups are stored in an inline flat magazine mounted on the inside surface of the cabinet door. This magazine is completely covered to protect the cups

from accidental contamination. The entire magazine may be swung out, for easy access to the inside of the cabinet door, without having to remove the cups from their place. The base plate of the magazine holds the cup dispenser separator.

Cups are moved from the storage position to a position over the dispensing mechanism (often referred to as the "cup drop") as needed. When a stack of cups over the drop has been reduced to four or five cups, the spiral cup motor switch will be closed, which permits the spiral motor to run. The spirals turn simultaneously to advance the remaining stacks of cups on the base plate toward the cup drop opening.

When the stack nearest the drop opening is pushed to the right it will drop into the remaining cups found in the drop mechanism. The new cups will open the cup spiral motor switch and disconnect the spiral motor from its voltage source.

The spirals are so designed that a stack of standard vending cups will nestle between the turns. It is important that the spirals are properly oriented with each other so that the stacks of cups will advance in a vertical position. Figure 13 of this section illustrates the relationship between the three spirals. When the spirals are properly adjusted the return wire at the end of the spirals will point as shown. When the upper two (which should be adjusted to the same position) point to 12 o'clock the lower spiral should be advanced to a 2 o'clock position. This is done because the lower end of a cup stack is smaller in diameter than at the top rims, where the spiral touches it. The spirals are properly set before the 1400 Freeze Dry leaves the factory and should not have to be adjusted before putting the machine

into service. If they are not properly set, see the "Adjustment" heading of this section.

The synchronized movement of the three spirals is maintained by the toothed drive belts which connect the spiral sprockets together and to the spiral drive motor sprocket.

NOTE: NEVER ATTEMPT TO ADJUST THE SPIRAL POSITIONS BY "JUMPING" THE DRIVE BELTS ON THEIR GEARED PULLEYS.

ADJUSTMENTS

The cup magazine has two adjustments. These are made when it is desired to change the cup size from either 7 or 8-1/4 ounce cups to a 9 ounce cup. The reverse procedure of items 8 and 9 must be followed when changing from a 9 ounce cup to either the 7 ounce or 8-1/4 ounce cups.

CHANGING TO A 9 OUNCE CUP

1. Remove the cup magazine cover.
2. Remove the cups from the magazine.
3. Remove the two screws (Figure 12) on each of the upper bearing plates for the spirals which are found on the left hand side of the magazine, as you face it.

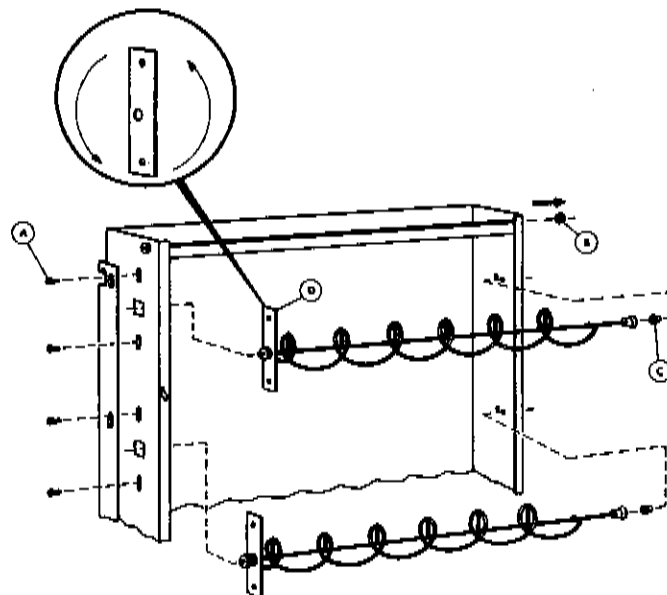


Figure 12 (Changing to a 9 ounce cup)

4. Remove the nut (B) from the right hand end of the magazine support angle.
5. Spring the right side of the magazine enough to free the end of the upper and center spiral shafts. Pull them out toward yourself.
6. Remove the belts from the upper and center pulleys and slip the pulley end of the spiral shafts out of the hold in the left hand side of the magazine.
7. Remove the nyliners (C) from the holes in which the spiral shafts had been and relocate them in the forward set of holes.
8. Rotate the bearing plate (D) so that the screw holes for mounting are lined up to the left of the shaft, as you view it from that end. This must be done for both the top and center spirals.
9. Re-install both the upper and center spiral assemblies. Leave the mounting screws on the bearing plates just loose enough so that the plates can still be hand adjusted.
10. Put the drive belts in place. Leave them loose; do not tighten them at this point.
11. Turn the bottom spiral until the wire on the right hand end points to 2 o'clock as previously described. (Figure 13).
12. Position the wire on the right hand end of the center spiral at 12 o'clock. (Figure 13)
13. Tighten the drive belt between the center and bottom spirals by pressing upward on the center spiral and tightening the mounting screws. Maintain the 12 o'clock and 2 o'clock relationship between the center and lower spirals when tightening the belt.

14. Position the wire of the right hand end of the top spiral at 12 o'clock.
15. Follow a similar belt tightening procedure for the top spiral as was performed on the center spiral. Be sure that the center and upper spirals both point in the direction of 12 o'clock while the bottom spiral points to 2 o'clock (refer to Figure 13).

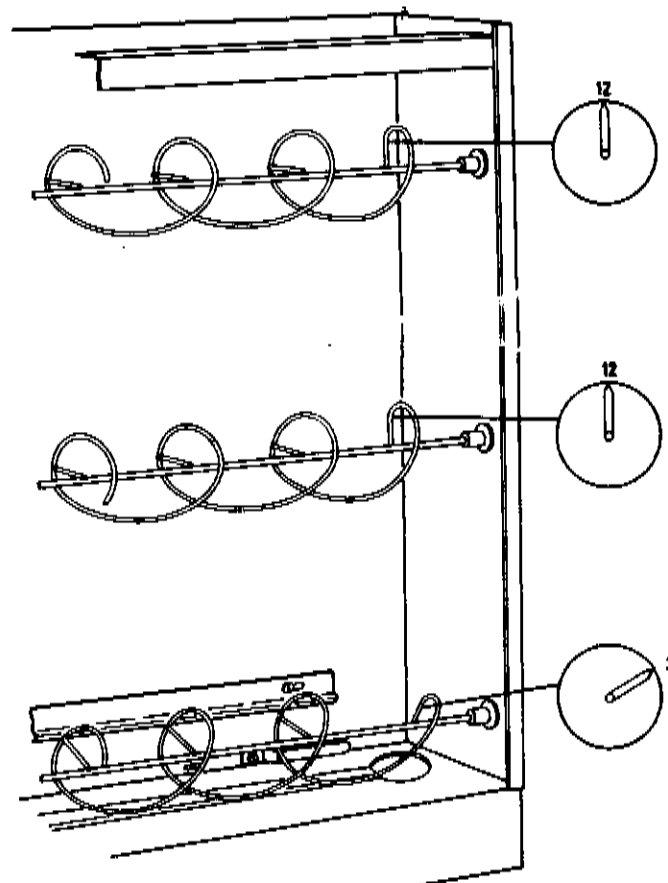


Figure 13 (Spiral adjustment)

THE LISERN CUP DROP SEPARATOR

If it is desired to change the cup size on the RMI 1400 FD machine equipped with the Lisern mechanism, e.g., 7 or 8-1/4 oz. to 9 oz. the mechanism itself must be replaced with one made for the particular cup size.

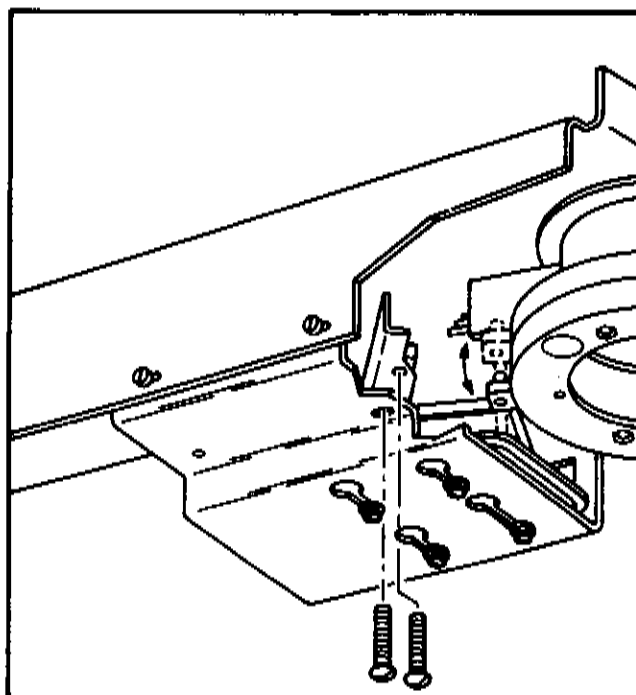


Figure 14 (Lisern mechanism)

ADJUSTING THE STOPPING POINT

Figure 14 is a representation of the switch assembly used with the Lisern mechanism. When this mechanism is at rest the actuator lever of the Lisern Separator is pulled back against the switch arm. When it is properly adjusted the actuator is approximately 1/32" to 1/16" from its limit of travel. If it is necessary to make an adjustment, slightly loosen the switch mounting screws and reposition the switch until the proper stopping point has been attained. Retighten the mounting screws after making the adjustment.

THE WATER SYSTEM

The water system in the RMI 1400 FD unit is a dependable, open, anti-syphon gravity system. The temperature control will maintain the water temperature at approximately 170°. The anti-syphon feature assures that if the water pressure of the supply mains should drop, no water will back-syphon from the tank or piping. The letters used in this description will relate to Figure 15.

WATER INTAKE SYSTEM

There are two possible configurations in the intake system. The standard method is a direct connection to the combination safety overflow and water inlet valve (A). The optional method provides for a water filter (R) to be installed as a part of the original equipment. The filter housing includes a shut-off valve as an integral part.

FILLING THE HOT WATER TANK

When the unit has been connected to the water supply and power has been applied, water will enter the unit through the inlet valve (A) pass through the filter (R) and into the top of the hot water tank. Water will fill the tank to the level of the float (T) which is connected to the Water Inlet Switch (C) located on the lid of the hot water tank. When this switch has been raised by the float, the water inlet valve will be de-energized and stop the flow of water to the hot water tank. Water will enter the tank after each drink has been dispensed, thus maintaining a constant head pressure for consistent beverages.

HEATING THE WATER IN THE HOT WATER TANK

After the initial filling of the tank and the float has allowed the switches to raise, power will be applied from the low water control

switch (D) through the thermostat (P) to the heating element (Q). The indicator light will go on and will remain lit until the thermostat has been satisfied. All of these controls are located on the lid of the hot water tank. The thermostat (P) is a fixed non-adjustable thermostat and will maintain the tank temperature at approximately 170°. If hotter water is required, higher temperature thermostats can be obtained. The heating element is a 1500 watt heater and can be easily removed from the top of the tank if ever necessary.

LOW WATER HEATER CONTROL SWITCH

This switch (D) is mounted to the right of the water inlet switch (C) and its only function is to protect the heating element from burning out in the event that the heating element is connected when there is no water in the tank.

LOW WATER C.R.E.M. CONTROL SWITCH

This switch (J) is mounted to the left of the water inlet switch (C) and its only function is to de-energize the Coin Return Electromagnet and return coins in the event that a low water condition exists in the hot water tank.

WATER OUTLET SYSTEM

Three valves comprise the water outlet system. They are - a valve for the Coffee, Tea and Sanka (F); the Chocolate Water outlet valve (G); and the Soup Water outlet valve (H). These three valves are all contained in the manifold housing (K). Each valve is controlled by its corresponding switch on the program timer and can be individually set to dispense the proper amount of water for the individual beverage.

Each valve has a vented elbow fitting at its outlet port with an adjustable restrictor screw. The vents are provided to assure that all

WATER SYSTEM 1400 F.D.

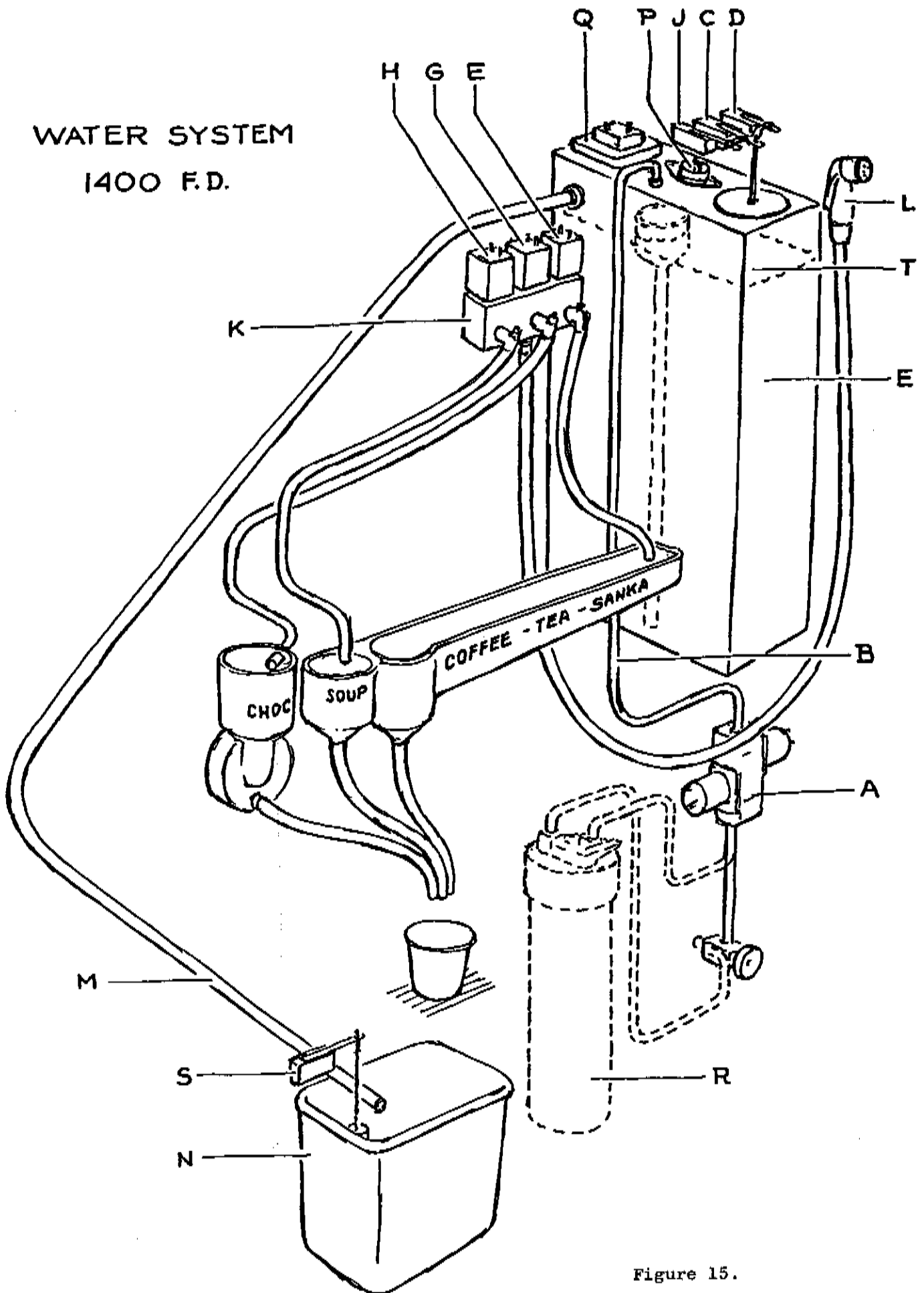


Figure 15.

the water released into the tubes is drained fully. Venting eliminates "after drip" from the water tubes.

OTHER FEATURES

1. Rinse Hose

A convenience feature is the rinse hose (L). This is provided for maintaining proper machine sanitation. It is long enough to reach each part of the machine which will normally require cleaning. To avoid any possibility of this hose leaking, a storage bracket has been provided which holds the outlet of the hose above the water level in the hot water tank.

2. Overflow Tube

The overflow tube (M) is connected to an outlet above the normal level of the tank. Should the water level rise too high, regardless of the reason, the excess will run directly to the waste pail (N).

3. Safety Overflow Switch

If the overflow condition continues, the level in the waste pail will rise and eventually raise the float of the safety overflow switch (S) shutting the combination safety and water inlet valve and place the machine on a "sold out" status. When on "sold out" any coins inserted will be returned.

COMMODITY SYSTEM

The support for the entire dry product commodity system is of open construction with a minimum of horizontal surfaces to catch dust and spillage. The motors which drive the canister augers are all located behind the cover. Each motor may be removed individually by loosening four screws and lifting

it out. Water tubes to direct the water to the trough and chocolate homogenizer may also be removed for cleaning or changing if necessary.

THE COMMODITY CANISTERS

The commodity canisters are constructed of translucent rugged plastic. They are designed to dispense products on a first in - first out basis in order to insure freshness of product.

The augering system used to dispense the products runs on reinforced glass-filled nylon bearings to insure long trouble-free life. The dispensing spouts of the canister are tapered upward to eliminate the possible sifting of dry product.

CHOCOLATE HOMOGENIZER

The chocolate is augered into the chocolate homogenizer which is controlled by 10,000 rpm whipper motor. This entire assembly can be easily disassembled for sanitation purposes without the use of tools. It is held together by spring clips. The unit is also shock mounted in order that other products are not disturbed by the vibration due to the speed of the motor.

HUMIDITY BAR

The unit is equipped with a humidity heat bar which is directly over the commodity canister spouts. It will eliminate the possible bridging of commodities due to high humidity within the unit. IT IS A VERY NECESSARY ITEM AND MUST BE USED AT ALL TIMES.

STEAM EXHAUST CONTROL SYSTEM

The steam from the hot water is controlled by this system. Uncontrolled steam in a vending machine will create several problems through caking and hardening of the dry products. Such a condition will

prevent proper dispensing.

By moving low velocity air in high volume through the areas where the steam is generated, the steam is removed before it can reach the dry product dispensers. The air is moved by a fan blade on an externally mounted motor and pushed through the air duct to the outside of the rear of the cabinet.

NOTE: THE MOTOR IS FULLY PROTECTED AS IT IS NOT ON THE DISCHARGE SIDE OF THE STEAM OR PRODUCT.

Steam is generated whenever the unit dispenses a beverage. The hot water passes through the respective troughs and mixing chambers as the dry products are dropped. Immediately behind the trough is a vacuum box which is connected to the exhaust duct. Directly over the trough is the steam deflector and commodity chute through which products are dropped into the moving liquid in the trough. The design of this deflector is such that a constant stream of dry air is pulled down through the commodity chutes of the deflector and also helps delivery of the product to the water. At the same time, this deflector prevents the steam vapor from rising into the area of the commodity canister outlets.

The trough, steam deflector, fan blade, and exhaust duct are easily removed for cleaning. Cleaning is done by rinsing in hot water.

(NOTE: THESE PARTS SHOULD BE THOROUGHLY DRIED AFTER SANITIZING.)