Sept. 29, 1970 J. K. McCOLLOUGH 3,530,638

COIN WRAPPING MACHINE

Filed April 4, 1969 4 Sheets-Sheet 1

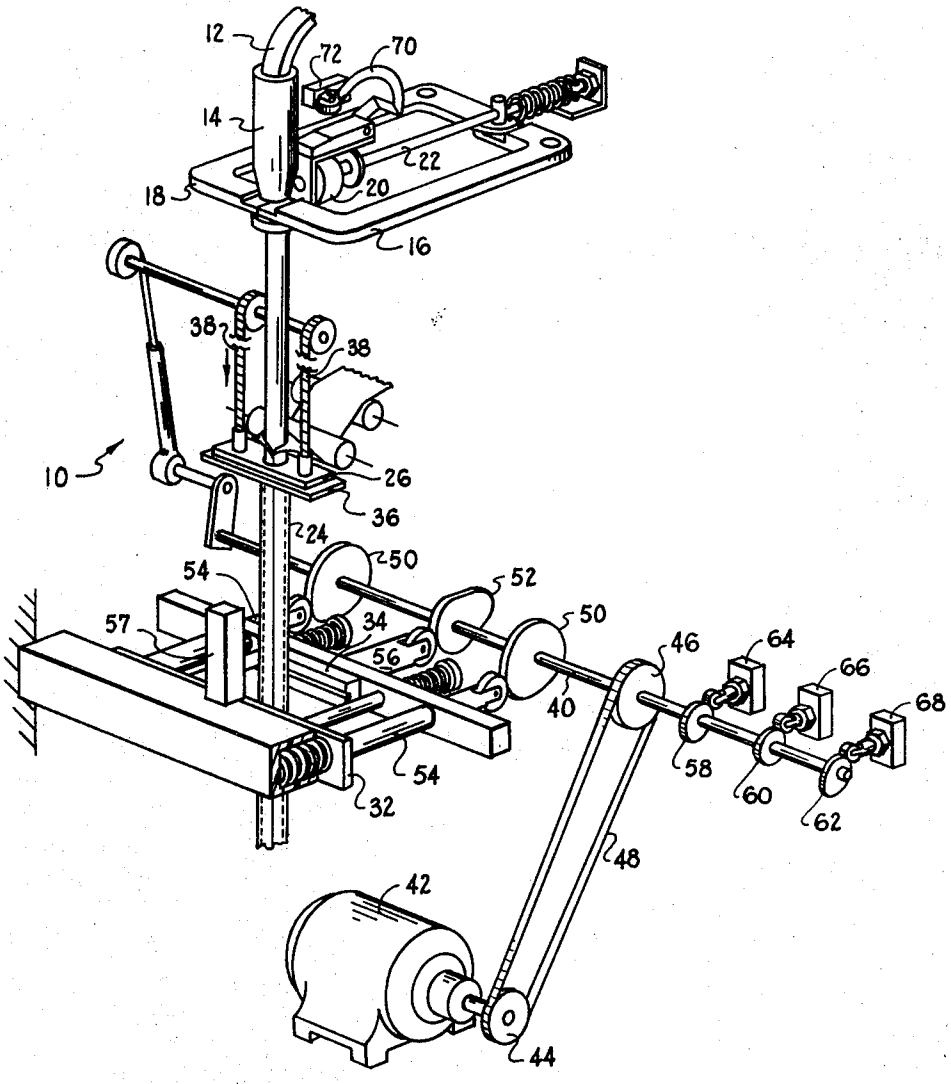


FIG.-1-

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COIN WRAPPING MACHINE

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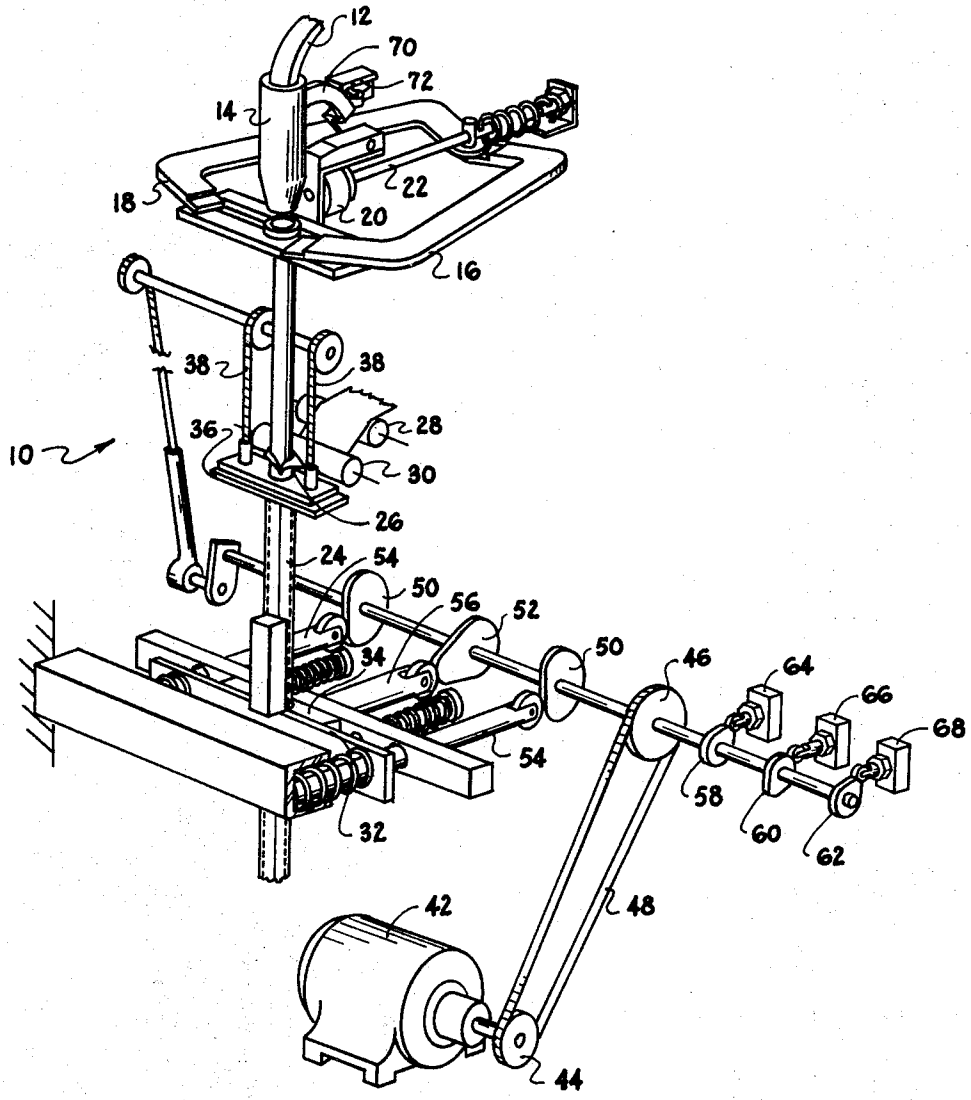


FIG.-2-

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COIN WRAPPING MACHINE

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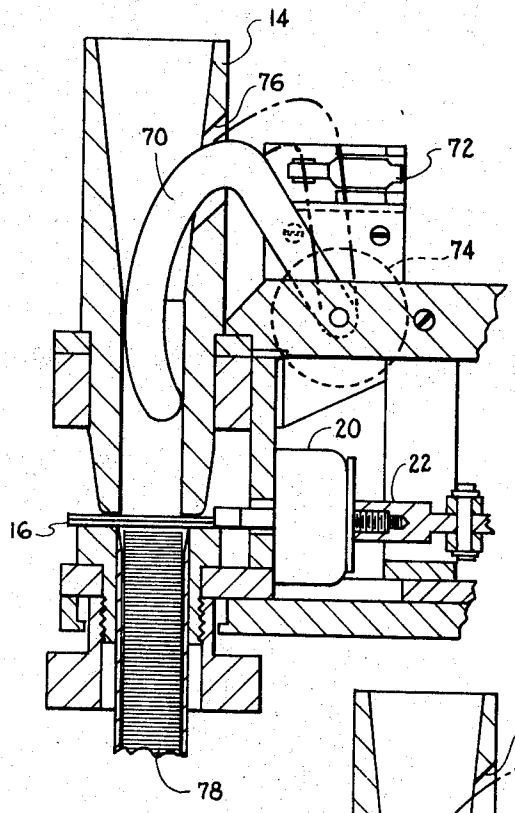


FIG.-3-

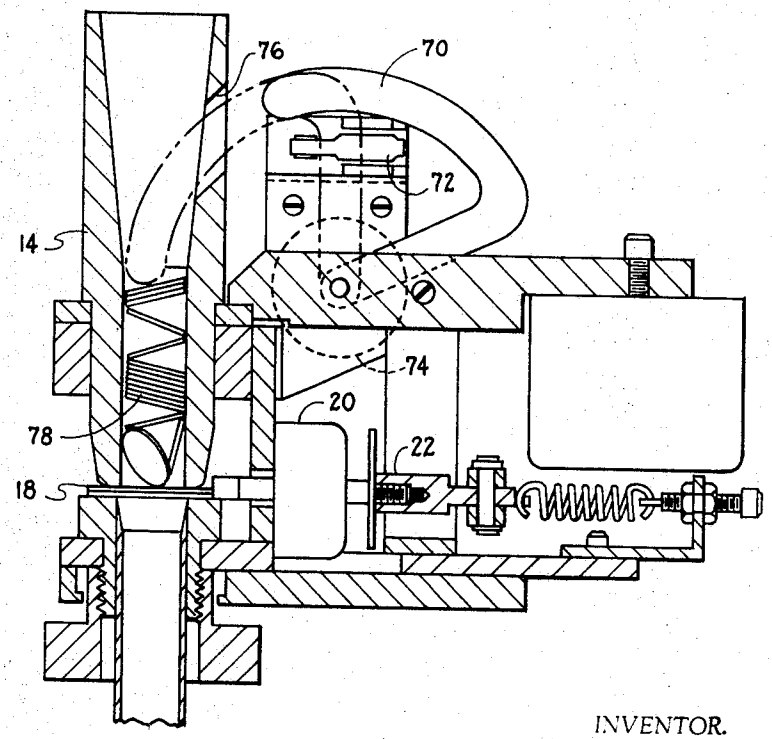


FIG.-4-

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COIN WRAPPING MACHINE

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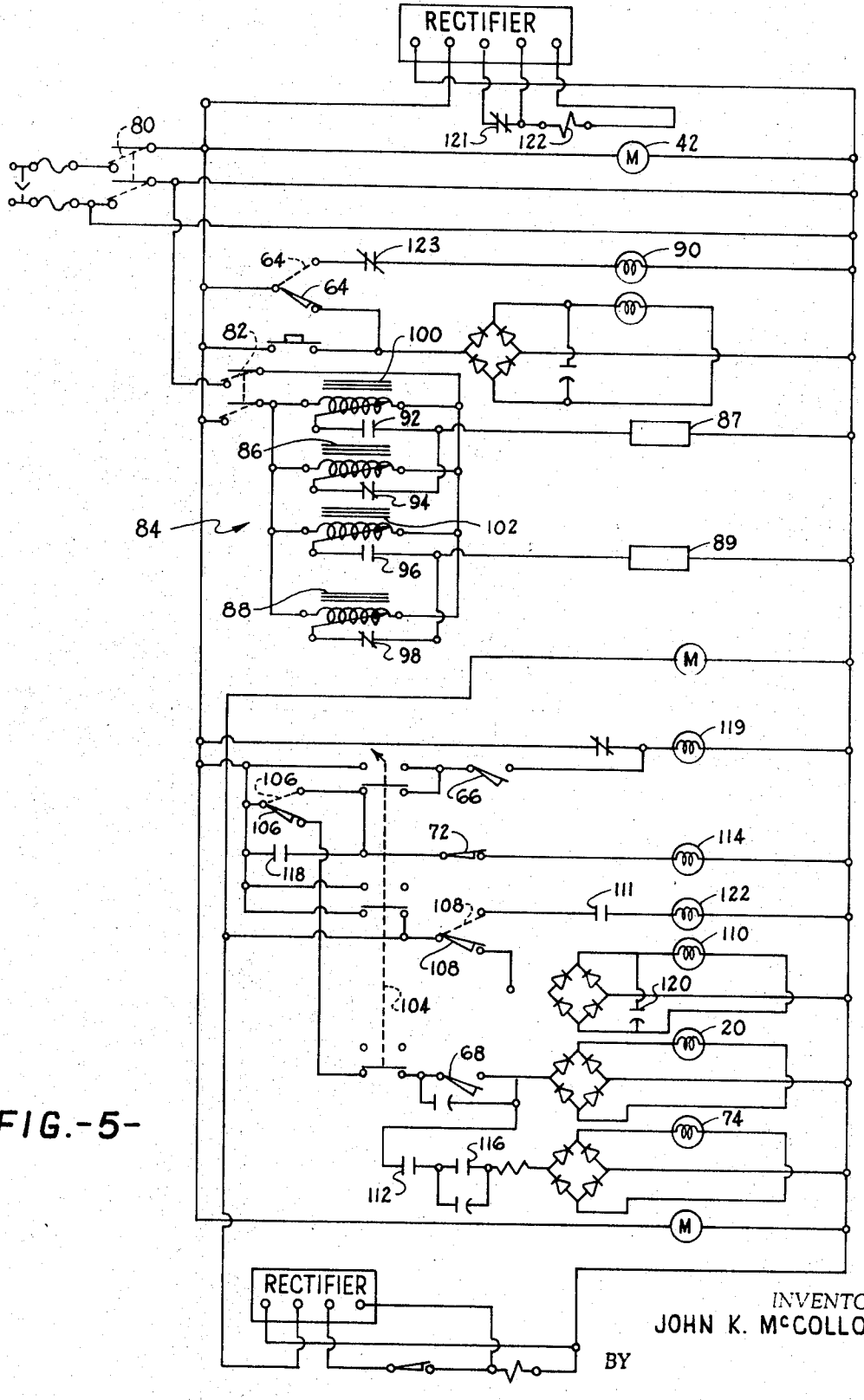


FIG.-5-

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3,530,638

COIN WRAPPING MACHINE

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Int. Cl. B65b 57/16
U.S. Cl. 53—77 9 Claims

ABSTRACT OF THE DISCLOSURE

Method and apparatus to detect the improper alignment of coins in a coin collection tube prior to the transfer of coins to a coin wrapping station and to stop the operation of the coin wrapping machine if the coin collection tube is not empty.

This invention relates generally to the automatic packaging of coins in a plastic container and in particular to the automatic packaging of a pre-selected number of coins in a thermoplastic heat shrinkable material.

It is therefore an object of the invention to provide a method and apparatus which automatically stops the operation of a coin wrapping machine upon the detection of a coin jam in the coin collection tube.

Other objects and advantages will become readily apparent as the specification proceeds to describe the invention with reference to the accompanying drawings, in which:

FIG. 1 is a schematic view of a coin wrapping machine when coins are being supplied to the coin collection tube;

FIG. 2 is a schematic view of the coin wrapping machine of FIG. 1 when the pallets have opened and coins have been delivered into the wrapping material;

FIGS. 3 and 4 are blown-up views of the coin jam detector used in the machine of FIGS. 1 and 2; and

FIG. 5 is a circuit diagram of the subject coin machine.

Looking now to FIGS. 1 and 2 there is schematically represented the pouch portion **10** of a coin wrapping machine which bags coins in a thermoplastic shrink film pouch and then automatically transports the filled pouches to a shrink oven (not shown) to shrink the shrink film down around the coins to provide a compact coin package.

Basically, coins are supplied through chute **12** into collection tube **14** onto the pallet members **16** and **18**. When a preselected number of coins has been delivered from a coin counter (not shown) into the collection tube **14**, solenoid **20** will be actuated and rod **22** will be pulled forward to open the pallet members **16** and **18** to the position in FIG. 2. The coins will drop into a tube of thermoplastic shrink film **24** supplied through the forming member **26** by rolls **28** and **30** from a roll of film (not shown) that has been previously sealed at the bottom by transverse sealing jaws **32** and **34**. After the tube of material **24** has been filled by the correct number of coins the carriage **36** carrying the forming member **26** is let down by chains **38** suitably connected to the main drive shaft **40** which is driven by motor **42** through pulleys **44** and **46** and belt **48**. The tube **24** is lowered until the top coin in the delivered stack is below the transverse sealing jaws **32** and **34**. Then, as shown in FIG. 2, suitable cams **50** and **52** acting through spring loaded actuated members **54** and **56** move the transverse sealing jaws **32** and **34** together to press and seal the top of the filled portion of the tube **24** together and sever the filled pouch from the tube of material **24**. Simultaneously therewith the longitudinal sealing member **57** is moved against the tube **24** to seal the longitudinal seam of the

tube. Then the forming member moves upwardly, as shown in FIG. 2, while the counter (not shown) is preparing to start another cycle.

Located adjacent the main drive shaft **40** and actuated by suitable cams **58**, **60** and **62** are switches **64**, **66** and **68**, respectively. Cam **58** and switch **64** control the impulse heat to the sealing jaws while cam **60** and switch **66** is a stop motion for the machine if the counter does not supply the predeterminned number of coins. Cam **62** and switch **68** control the opening and closing of the pallet members **16** and **18**. The cams **58**, **60** and **62** are suitably designed and synchronized with the switches **64**, **66** and **68** to perform the intended function at the appropriate time in each cycle.

Mounted to the rear of the collection tube is a jam detector which consists of a curved feeler arm **70** rotated by a rotary solenoid and a switch **72** which is engaged by the feeler arm. The jam detector is actuated by actuation of the rotary solenoid, after the pallet members **16** and **18** have opened, to rotate the feeler arm **70** into an opening in the rear of the collection tube. On its forward motion into the collection tube **14** the feeler arm **70** engages the switch **72** and will release the switch **72** if no coins are jammed in the tube **14** allowing the feeler arm **70** to rotate all the way forward. If coins are jammed in the tube the feeler arm **70** will not allow the switch **72** to be energized thereby stopping the operation of the machine until the jam is eliminated by the operator.

FIGS. 3 and 4 shows the jam detector in detail with a rotary solenoid represented by the reference numeral **74**. As can be seen in FIG. 3 the feeler arm **70** rotates through the opening **76** in the collection tube **14** to a position where switch **72** is released when all of the coins **78** have dropped out of the tube **14**. Looking now to FIG. 4 is can also be seen that the switch **72** will be prevented from opening since the feeler arm **70** is stopped from being projected all the way into the tube **14** by the coins **78**.

OPERATION

Looking now to FIG. 5 in conjunction with FIGS. 1–4 the operation of the coin wrapping machine will be explained. To connect power to the machine drive switch **80** is turned to the dotted line position to energize the drive motor **42** and heat seal switch **82** is turned to the dotted line position to supply power to the control circuit **84** for the heat sealing jaws **32**, **34** and **57**. When the heat seal switch **82** is turned on, transformers **86** and **88** which provide low heat to the heat sealing jaws **32**, **34** and **57** are energized since relay coil **90** for contacts **92**, **94**, **96** and **98** is not energized thereby supplying low heat current through closed contacts **94** and **98** to end seal and longitudinal seal electric heaters **87** and **89**. When the machine cycles and switch **64** is actuated by cam **58** indicating that it is the proper time to seal the tube **24**, it will assume the dotted line position and energize the relay coil **90** which opens contacts **94** and **98** and closes contacts **92** and **96** to supply current to transformers **100** and **102** to provide high impulse heat to electric heaters **87** and **89** to supply high heat to the heat sealing jaws **32**, **34** and **57** to seal the tube **24**. Then as soon as the cam **58** rotates further, switch **64** opens and deenergizes the relay coil **90** to reverse contacts **92**, **94**, **96** and **98** to once again supply low heat to the heat sealing jaws.

The control circuit has a three position selector **104** which in one position allows single cycle operations and in a second position allows the machine to run empty with the counter off. In the third position, as shown in the circuit diagram, the machine cycles normally. If the coin counter has not completed the coin count, switch **106** will be in the dotted line position so that the circuit to the pallet solenoid **20** will be open keeping the pallet

members **16** and **18** closed. When the counter has completed the coin count the switch **106** is automatically moved to the solid line position so that the switch **68** can be closed by cam **62** to energize the pallet solenoid **20** to open the pallet members **16** and **18** and drop coins into the tube **24** below the pallet members.

When the pallet members open, pallet switch **108** transfers to the solid line position energizing relay coil **110** to close contacts **111** and **112** to energize jam detector solenoid **74** to cause the feeler arm **70** to move into the collection tube **14**. If the tube **14** is clear of coins the feeler arm **70** completes its stroke allowing switch **72** to be opened thereby deenergizing relay coil **114** to open switch **116**. The opening of switch **116** deenergizes the jam detector solenoid **74** thereby retracting the feeler arm from the collection tube. As the feeler arm **70** moves out of the tube switch **72** again closes but does not energize the relay coil **114** since switch **118** is open. If the feeler arm does not complete its stroke, switch **72** will not open and will then complete a circuit through switch **66** when it is closed by cam **60** to energize the relay coil **119** to open the contacts **121** to break the circuit to open the circuit to the clutch **123** and stop the transmission of power to the machine.

Switch **66** also energizes the relay coil **119** to open the circuit to the clutch **123** if the coin count switch **106** is in the dotted line position, indicating that the count is not complete, thereby preventing the packaging of an improper amount of coins in any package.

The pallet members **16** and **18** remain open as long as cam **62** holds switch **68** closed. When the cam **62** releases switch **68** pallet solenoid **20** becomes deenergized thereby closing the pallet members for the next cycle. When this happens, pallet switch **108** transfers to the dotted line. Relay coil **110** remains energized for a fraction of a second because of the charge built up by the capacitor **120**, thereby energizing the counter start solenoid **122** since switch **111** is still closed. Once the counter is restarted the switch **111** opens deenergizing the counter start solenoid **122**.

As soon as the counter starts the new count switch **106** transfers to the dotted line position to once again energize the relay coil **114** closing contacts **116** and **118** so that when the counter finishes its count relay coil **114** remains energized through switch **118** and switch **72**. The above cycle then repeats itself.

As disclosed above, I have provided a novel coin wrapping machine which provides a control to stop the operation of the machine to prevent damage thereto due to the jamming of coins in the coin collection tube.

Although I have described in detail the preferred embodiment of my invention I contemplate that many changes may be made without departing from the scope or spirit of my invention and I desire to be limited only by the claims.

That which is claimed is:

1. A method of packaging a preselected number of coins in a coin packaging machine comprising the steps of: depositing a predetermined number of coins in a collection area, supplying the predetermined number of coins to a packaging area, automatically inspecting the collection area to determine if all the coins have been delivered to the packaging area and automatically stopping the packaging machine when the inspection of the collection area determines that coins remain in the collection area.

2. A machine to package a preselected number of coins comprising: a coin collection tube, means supplying coins to said tube, a coin packaging station, means to control the passage of coins between said collection tube and said packaging station and detection means operably associated with said collection tube to stop said machine if coins jam up in said collection tube.

3. The structure of claim **2** wherein said collection tube has an opening formed in the wall thereof and said detection means includes a feeler arm which rotates into and out of said opening.

4. The structure of claim **3** wherein said feeler arm is mounted on a rotary solenoid, said machine including a control circuit to rotate said feeler arm into said opening when the coins therein are transferred to said packaging station.

5. The structure of claim **4** wherein said means to control the passage of coins from said collection tube to said packaging station includes a pallet member between said tube and said packaging station which holds the coins in said tube until actuated to open.

6. The structure of claim **2** wherein said packaging station includes means to supply packaging material to said station, a forming member to form the packaging material into a tube, and a pair of heat sealing jaws to flat press said tube at a predetermined time to form a transverse seal therein.

7. The structure of claim **6** wherein said collection tube has an opening formed in the wall thereof and said detection means includes a feeler arm which rotates into and out of said opening.

8. The structure of claim **7** wherein said feeler arm is mounted on a rotary solenoid, said machine including a control circuit to rotate said feeler arm into said opening when the coins therein are transferred to said packaging station.

9. The structure of claim **8** wherein said means to control the passage of coins from said collection tube to said packaging station includes a pallet member between said tube and said packaging station which holds the coins in said tube until actuated to open.

References Cited

UNITED STATES PATENTS

1,484,870	2/1924	Burdick	53—77 X
3,469,365	9/1969	Uchida et al.	53—78 X

TRAVIS S. McGEHEE, Primary Examiner

U.S. Cl. X.R.

53—3, 78