Dec. 29, 1970 J. K. McCOLLOUGH ET AL 3,550,350

COIN CONVEYOR

Filed June 3, 1968 2 Sheets-Sheet 1

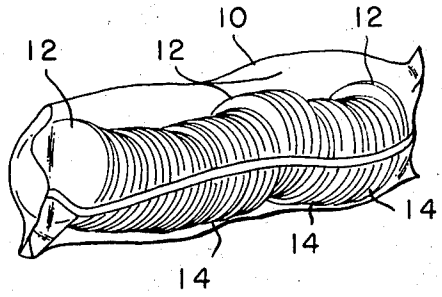


FIG. -1-

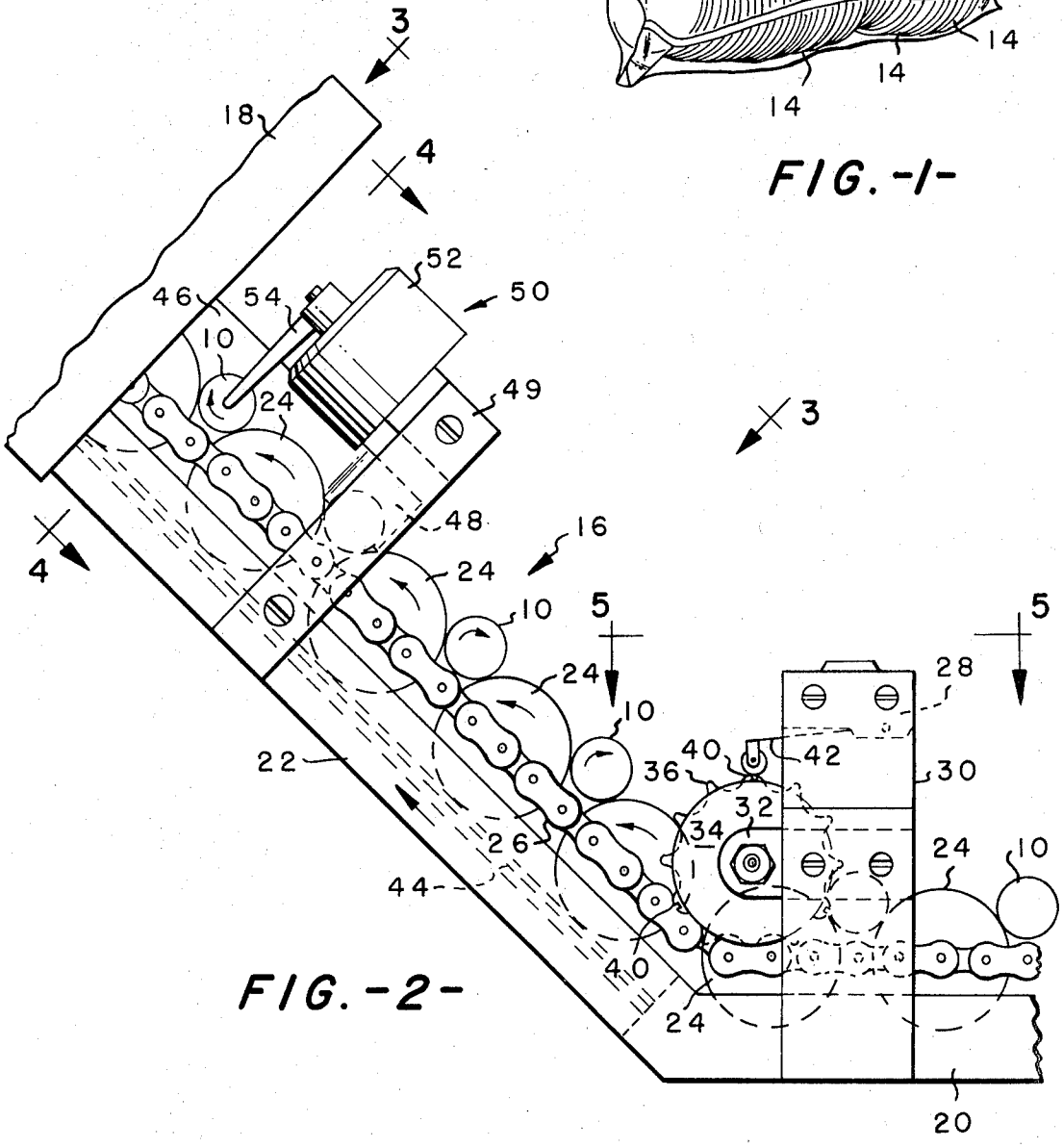


FIG. -2-

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Filed June 3, 1968 2 Sheets-Sheet 2

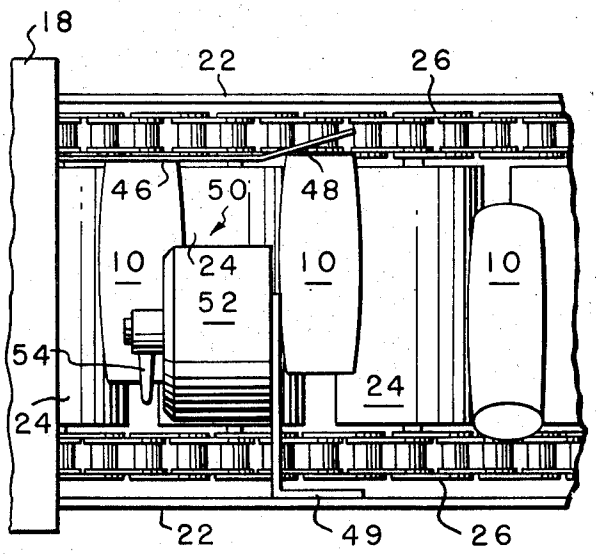


FIG. -3-

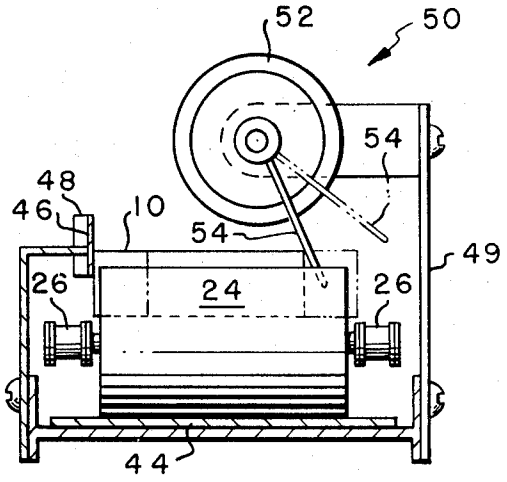


FIG. -4-

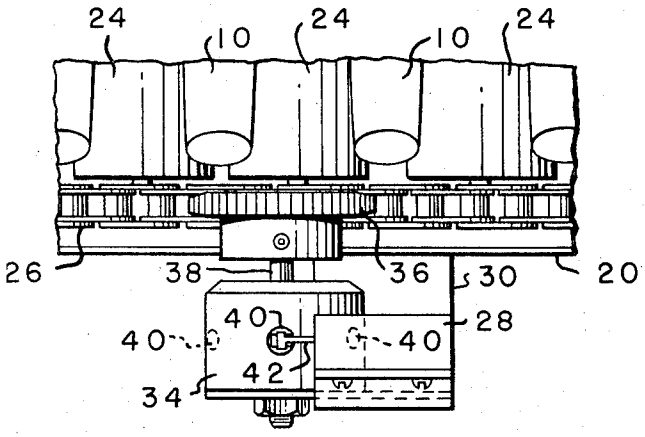


FIG. -5-

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United States Patent Office 3,550,350 Patented Dec. 29, 1970

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COIN CONVEYOR

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Filed June 3, 1968, Ser. No. 734,053
Int. Cl. B65b 61/00
U.S. Cl. 53—167 4 Claims

ABSTRACT OF THE DISCLOSURE

Apparatus to align misaligned coins in a package prior to completion of the final package to provide a compact roll of packaged coins. An automatic kicker is used to push a package of loosely packaged coins against a plate to straighten the coins in the package.

In copending application Ser. No. 643,258 there is disclosed a method and apparatus to seal a predetermined number of coins in a heat shrinkable bag and convey the bag to a heat shrink oven to shrink the film down around the coins to provide a compact roll of wrapped coins. When coins have been packaged loosely in an oversize bag prior to shrinking of the bag the coins tend to lean in one direction or the other which, if left in this condition, would provide a parallelogram shaped package when the film is shrunk around the coins. It has also been found that when the coins are initially packaged in the shrink film that, due to the looseness of the bag, some of the coins become misaligned and when the bag is heat shrunk these misaligned coins cause bulges in the film presenting an appearance which is not appealing to the eye. Further, in extreme cases it is possible for the misaligned coins to cause a hole to form in the bag as it is shrunk down around the coins.

Therefore it is an object of the invention to provide apparatus to straighten and align misaligned coins in a container prior to completion of the container into a compact roll of wrapped coins.

Another object of the invention is to straighten and align misaligned coins contained in a sealed bag of heat shrinkable film prior to the supply of such bag to a heat shrink oven to shrink the film around the coins to form a compact roll of wrapped coins.

Other objects and advantages of the invention will be clearly apparent as the specification proceeds to describe the invention with reference to the accompanying drawings in which:

FIG. 1 is a perspective view of a roll of coins contained in a sealed heat shrinkable film bag prior to heating showing the coins leaning in one direction;

FIG. 2 is a side elevation view of the conveyor system suppling rolls of coins to a shrink oven;

FIG. 3 is a top view taken on line 3—3 of FIG. 2;

FIG. 4 is a section view of the coin kicker taken on line 4—4 of FIG. 2; and

FIG. 5 is a view taken on line 5—5 of FIG. 2.

Looking now to the drawings and especially to FIG. 1, the reference numeral **10** represents a roll of coins sealed in a heat shrinkable film bag. It should be noted that in this type of bag the coins tend to lean one way or the other and if the bag is shrunk while the coins are in this position the roll of wrapped coins will remain in this position with the coins inclined to the vertical. Further, some of the coins **12** are not properly aligned with other coins **14** and it is obvious that if the bag is heat shrunk down around the coins that bulges will be formed in the bag by the coins **12**.

Looking now to FIG. 2 the basic system is shown in that sealed bags of coins **10** are carried on a conveyor

16 to a shrink oven **18** wherein the heat shrinkable film is shrunk around the coins. From the shrink oven **18** the compact rolls of coins are delivered to a bagger or boxer for shipment to the consumer.

The conveyor **16** driven by any suitable means consists of a straight section **20** and an upwardly inclined section **22** into the shrink oven **18**. Operably associated with the conveyor are a plurality of rolls **24** spaced from one another by a chain link **26** which also rotatably supports the rolls **24**. The space between adjacent rolls **24** accommodates the coin rolls **10**.

Mounted to the straight section **20** of the conveyor **16** by a suitable support member **30** is a micro-switch **28**. Support member **30** through arm **32** rotatably supports actuator **34** and sprocket **36** both of which are connected to a suitable shaft **38**. The sprocket **36** engages the chain link **26** and holds it in the down position as the chain link changes direction from the straight portion **20** upward toward the shrink oven **18** along the upward conveyor portion **22**.

The actuator **34** has a plurality of contact members **40** thereon, which in the preferred form of the invention are screws, which engage the switch arm **42** of the micro-switch **28** to make the micro-switch each time the switch arm engages one of the contact members **40** when the actuator **34** is rotated by the rotation of the sprocket **36** caused by the movement of the chain link **26** when moved by the drive means (not shown). The arc distance between adjacent contact members is the distance equivalent to the distance between the axial centerlines of adjacent rolls **24** so that every time the chain link moves a distance equivalent to the distance between the axial centerlines of adjacent rolls **24** the switch arm **42** of the micro-switch **28** will be engaged by one of the contacts **40** and the micro-switch will be made for reasons hereinafter explained.

As discussed previously, adjacent rolls **24** are rotatably supported by the chain link **26** and spaced from one another a pre-determined distance to provide an area to support and rotate the coin rolls **10** as they proceed through the shrink oven **18**. On the upward portion of the conveyor **16** the rolls **24** contact plate type members **44** and are rotated thereby in the direction indicated by the arrows. In turn, rotation of the rolls **24** cause the coin rolls **10** to rotate in the direction indicated by the arrows to provide for even shrinkage of the film around the coins and to keep the coins in correct alignment during shrinkage of the film.

Mounted to the upper portion of the conveyor on one side thereof adjacent the entrance to the oven **18** is a deflector plate with a straight portion **46** and flared out portion **48**. The flared out portion **48** guides those coin rolls **10** back onto the conveyor in proper position that have been placed in the space between the rolls with one end overhanging the rolls as shown in FIG. 3. Mounted by a suitable support member **49** on the other side of the upper portion **22** of the conveyor opposite to the straight deflector portion is a solenoid actuated kicker **50**. The solenoid actuated kicker consists basically of a rotary solenoid **52** and a kicker arm **54** which, when rotated toward the conveyor, hits the end of the coin package roll **10** and forces it over against the deflector plate portion **46**. The impact of the kicker arm **54** aligns the coins **12** and **14** in the coin roll **10** and the combination of the kicker arm and the deflector plate portion **46** places the coins in the upright vertical position. Preferably, the kicker **50** is located adjacent the entrance to the shrink oven so that the coins do not have an opportunity to get misaligned again. Note particularly FIG. 4 where actuated position of the kicker arm **54** is shown in solid lines and the deactivated position is shown in phantom.

OPERATION

The sealed rolls of coins **10** are placed on the straight conveyor portion **20** in the space between adjacent rolls **24** by any suitable means (not shown). The rolls of coins travel up the inclined conveyor portion until they are kicked by the kicker arm **52** and forced against the deflector **46**. The rolls of coins **10** then proceed into the oven **18** wherein the shrink film is shrunk down around the coins. Then the completed coin roll is supplied to a boxing or bagging machine which packages a pre-determined number of rolls for shipment to the consumer.

The diameter of the actuator and the number of contacts are so selected that the switch arm **42** will actuate the micro-switch **28** every time the center of the space between adjacent rolls passes the kicker arm **54**. The micro-switch, each time it is actuated or made, energizes the rotary solenoid **52** to rotate the kicker arm **54** toward the conveyor to kick the coin roll **10** toward the deflector plate portion **46**. The kicker arm **54** will be actuated every time whether there is a roll of coins **10** in the space or not to insure that all coin rolls **10** are aligned properly before entrance into the shrink oven **18**.

It can be seen that the herein disclosed apparatus automatically aligns the coins in a sealed shrink film bag so that upon shrinkage of the film in the shrink oven thereon will provide a compact roll of wrapped coins which is smooth and appealing to the eye.

Although we have described in detail the preferred embodiment of our invention, it is contemplated that many changes may be made without departing from the scope or spirit of our invention and we desire to be limited only by the claims.

That which is claimed is:

1. Coin handling apparatus comprising: a shrink oven, conveying means to convey shrink film wrapped rolls of coins to said oven, said conveyor having a plurality of rollers with adjacent rollers being spaced from one another to accommodate a roll of coins therebetween, and means to align coins in said rolls comprising plate means mounted on said conveyor adajcent to the entrance to said shrink oven and means to force each of the rolls of coins against said plate means.

2. The apparatus of claim **1** wherein said means to align coins further includes an actuator means upstream of said means to force each of said rolls of coins against said plate means to energize said means to align coins when the space between each adjacent set of rollers passes said means to align coins.

3. The structure of claim **2** wherein said means to align coins includes a rotary solenoid and a kicker arm, said kicker arm engaging said rolls of coins when said solenoid is energized.

4. The structure of claim **3** wherein said actuator means includes a micro-switch and a contact wheel rotated by said conveyor to close said micro-switch periodically to energize said rotary solenoid.

References Cited

UNITED STATES PATENTS

2,920,737	1/1960	Engleson et al.	198—29
3,009,559	11/1961	Suttie	198—29
3,340,882	9/1967	Holmes et al.	53—212X

FOREIGN PATENTS

1,412,216	8/1965	France	53—30

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U.S. Cl. X.R.

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