May 13, 1958 J. P. JAKOB 2,834,286

ARTICLE MARKING MECHANISM

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Fig. 1

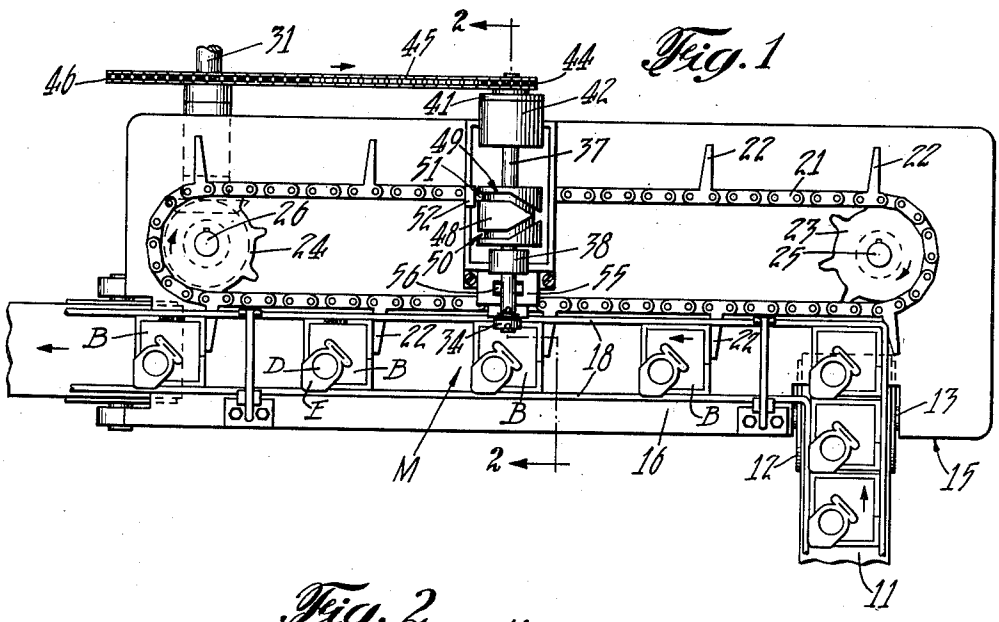
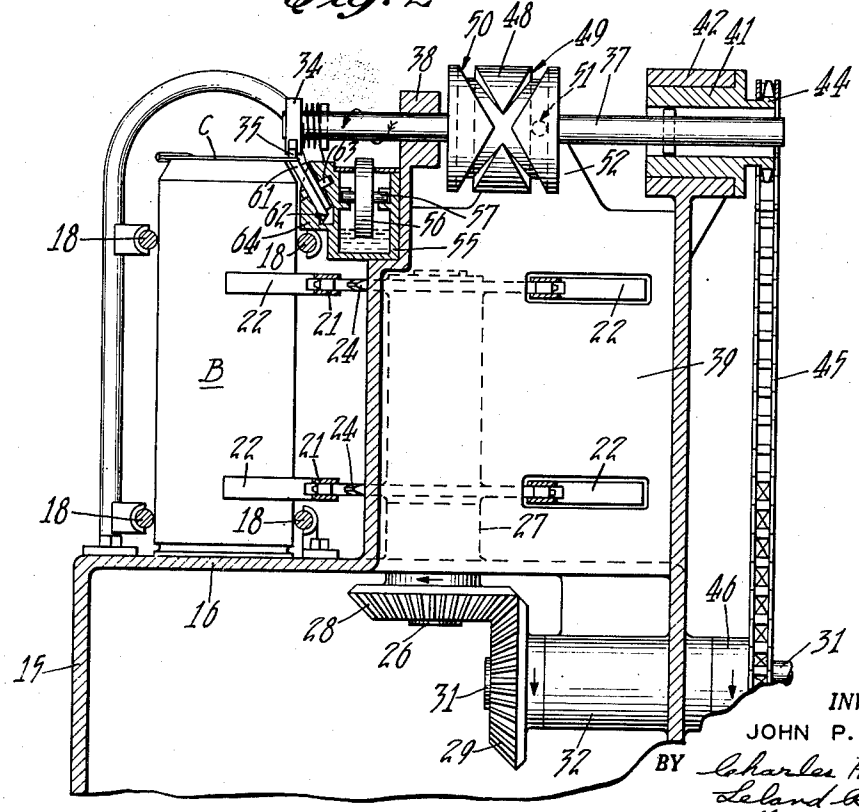


Fig. 2



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Fig. 3

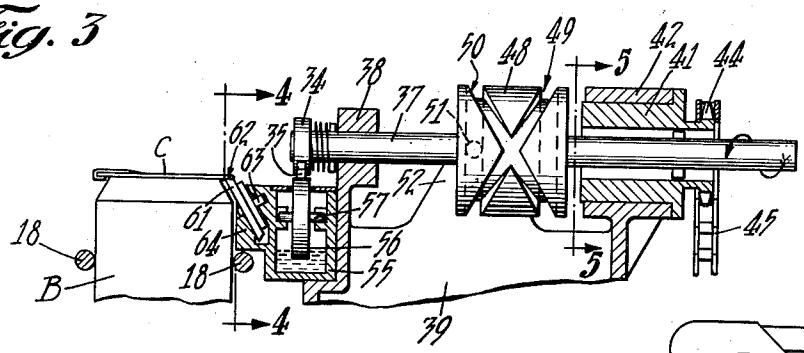


Fig. 4

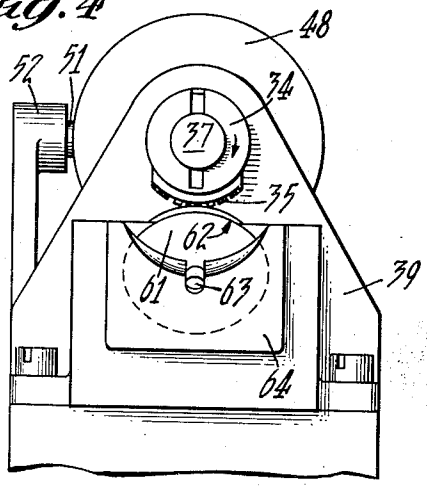
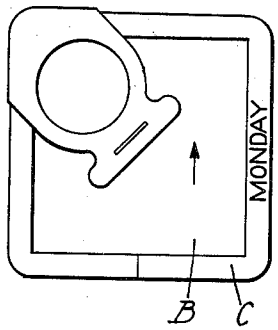


Fig. 7



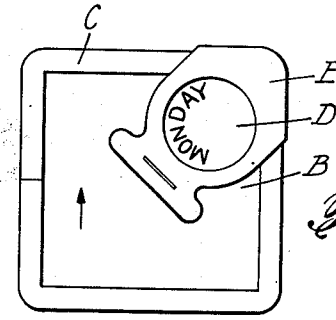
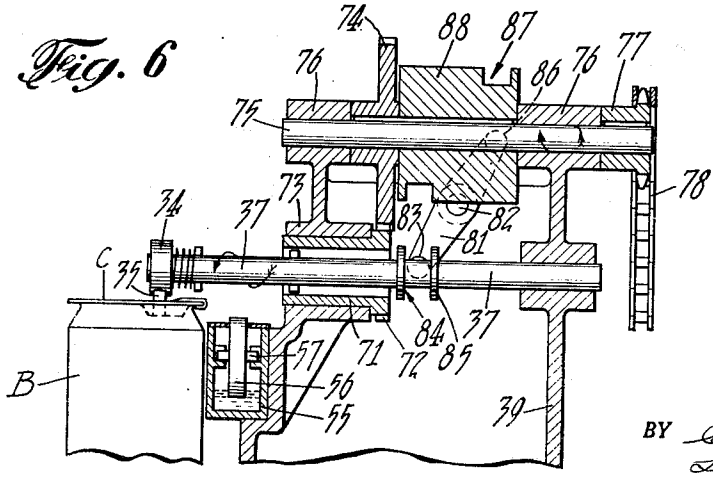


Fig. 8

Fig. 6



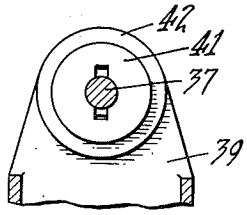


Fig. 5

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ARTICLE MARKING MECHANISM

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Application March 9, 1955, Serial No. 493,237

1 Claim. (Cl. 101—35)

The present invention relates to a mechanism for marking articles such as containers with an identifying legend, symbol or mark and has particular reference to such a mechanism which utilizes fluid ink as a marking medium.

An object of the invention is the provision of a marking mechanism which is particularly adapted for use in marking hollow fragile articles moving in a substantially continuous procession, the marking being effected without stopping the articles.

Another object is the provision of such a marking mechanism wherein the marking die is movable between the articles to be marked and a source of ink so as to keep the supply of ink remote from the articles and thereby maintain the articles in a clean condition.

Another object is the provision of such a marking mechanism which is simple and economical to build and maintain in food packing plants.

Numerous other objects and advantages of the invention will be apparent as it is better understood from the following description, which, taken in connection with the accompanying drawings, discloses a preferred embodiment thereof.

Referring to the drawings:

Figure 1 is a top plan view of a mechanism embodying the instant invention, with parts broken away;

Fig. 2 is an enlarged sectional view as taken substantially along the broken line 2—2 in Fig. 1, parts being broken away;

Fig. 3 is a fragmentary sectional view similar to Fig. 2 and showing certain of the parts in a different position;

Fig. 4 is an enlarged side elevation as viewed substantially along a plane indicated by the broken line 4—4 in Fig. 3, parts being broken away;

Fig. 5 is a sectional view taken substantially along the line 5—5 in Fig. 3;

Fig. 6 is a sectional view similar to Fig. 2 and showing a modified form of the invention, parts being broken away; and

Figs. 7 and 8 are enlarged top plan views of articles marked by the mechanism embodying the invention.

As a preferred or exemplary embodiment of the instant invention the drawings illustrate a marking mechanism for printing a permanent, legible identifying mark, for example the mark "Monday" (Figs. 7 and 8) on an article B to be marked. By way of example, the drawings show the article to be marked as a rectangular shaped fibre milk container of the character disclosed in United States Patent 2,085,979 issued July 6, 1937, to John M. Hothersall although the invention is equally well adapted to marking a great variety of other articles. The mark imprinted on the container is shown as a day of the calendar week and preferably is applied to the upper face of an outwardly projecting flat folded end seam C (Fig. 7) of the container although it may be applied elsewhere as shown for example in Fig. 8 where it is located on a countersunk panel D of a closure E of the container.

In the preferred showing (Figs. 1 to 5 inclusive) the

containers B are fed into the mechanism in a continuous procession in upright position with their tops uppermost, by an endless feed-in belt conveyor 11 (Fig. 1) which is actuated in any suitable manner. The conveyor 11 operates over a pulley 12 mounted on a shaft 13 journalled in suitable bearings formed in a frame 15 which constitutes the main frame of the mechanism.

The belt conveyor 11 preferably delivers the containers B onto a flat horizontal table 16 of the frame 15. As each container B is received on the table 16 it is swept laterally along the table, between a pair of spaced and parallel guide rails 18 (see also Fig. 2) which guide the containers through a marking station M. This lateral advancement of the containers is effected in spaced and timed order, by a pair of spaced and parallel, horizontally disposed endless chain conveyors 21 having feed dogs 22 secured thereto in spaced relation for engaging and propelling the containers.

The conveyors 21 operate in unison over a pair of idler sprockets 23 and a pair of driving sprockets 24 mounted respectively on a vertically disposed idler shaft 25 and a driving shaft 26. These shafts 25, 26 are journaled in bearings 27 formed on the table 16 of the frame 15. The drive shaft 26 is driven by a bevel gear 28 carried on the lower end of the shaft and meshing with a bevel gear 29. The gear 29 is mounted on a main drive shaft 31 which is rotated in any suitable manner. The shaft 31 is journaled in a bearing 32 formed in the frame 15.

As each container B, advanced by the conveyors 21, passes through the marking station M, it is marked with an identifying mark as mentioned hereinbefore, the mark preferably being applied to the upper face of the projecting end seam C. This marking of the container is effected without stopping or otherwise interrupting its advancement. For this purpose, there is provided at the marking station a marking device which includes a rotatable disk-like marking head 34 which carries on its outer periphery a marking die 35 (see Fig. 4). This die 35 may be of the hard impression cutting class in which case it usually is made of steel or may be of the soft imprinting type, usually made of rubber or other similar material. In the instant case, the rubber die is preferred so as to use a fluid ink for the identifying mark.

The marking head 34 is mounted for rotation and also for reciprocation between the path of travel of the containers and a source of fluid ink, in time with the advancement of the containers through the marking station M. For this purpose the marking head 34 is removably mounted but securely locked in place on one end of a horizontally disposed actuating shaft 37 which adjacent the head is journaled for rotation and longitudinal sliding movement, in a bearing 38 formed in a bracket 39 which extends up from the table 16 of the frame 15. At its opposite end the shaft is slidably keyed (see Fig. 5) in a sleeve 41 which is journaled in a bearing 42 in the bracket 39. The sleeve 41 preferably is integral with a spocket 44 which is driven in the proper direction by an endless chain 45 which operates over a sprocket 46 on the main drive shaft 31. Through this connection with the main shaft 31, the marking head 34 is actuated in time with the advancement of the containers.

Reciprocation of the marking head 34 is effected through reciprocation of the head shaft 37 while it is rotating. This reciprocation preferably is brought about by a barrel cam 48 which is mounted on the shaft intermediate its bearings 38, 42 and rotates with the shaft. The cam 48 is formed with a pair of cam grooves 49, 50 which extend in spaced and parallel relation around substantially one half of the periphery of the cam as shown in Fig. 1, and around the remaining periphery of the cam, cross each other as shown in Fig. 2 to afford communication between the grooves and in effect constitut-

ing one single endless groove. These grooves **49, 50** operate against a cam follower consisting of a stationary pin **51** which projects into the grooves and which is held against movement in a lug **52** formed on the bracket **39**.

Hence as the rotating cam **48** operates against the stationary pin **51** with the pin in the groove **49** as shown in Figs. 1 and 2, the cam makes substantially a half revolution without shifting the head shaft **37** longitudinally and during this half revolution, the marking die **35** on the rotating head **34** rolls against the top of a passing container B and imprints the identifying mark on the container. The container is timed to pass through the marking station during this portion of the cycle of operation of the marking head **34** for this purpose.

As soon as the marking die **35** is clear of the container, following a marking operation, and during the second half revolution of the cam **48**, the cross-over portion of the cam grooves **49, 50** rotates against the stationary pin **51** and thus causes the pin to cross over from the groove **49** to the groove **50**. This action shifts the cam **48** and the shaft **37** connected thereto, along the axis of the shaft from the position shown in Figs. 1 and 2 to the position shown in Fig. 3 and thus retracts the marking head **34** from the path of travel of the containers and positions the head over a source of fluid ink to pick up a charge of the ink for the marking operation on the next container to be advanced through the marking station by the conveyors **21**.

Thus after the cam **48** has made one complete revolution and during the time it rotates half of a second revolution, while the pin **51** is in the groove **50**, the cam rotates without shifting laterally and thus holds the marking head **34** in place to pick up its charge of ink. During the next half revolution of the cam, it again rotates the cross-over portion of the cam against the pin **51** and thus causes the pin to ride back into the cam groove **49**. This again causes the cam **48** and its head shaft **37** to shift longitudinally of the axis of the shaft, but in the opposite direction to carry the marking head **34** forward into place over the path of travel of the containers for the marking operation on the next following container.

Thus the cycle of operation of the cam **48** is to impart two revolutions and one reciprocation to marking head shaft **37** for each container advanced to the marking station by a conveyor dog **22**. The first quarter cycle (one-half revolution) holds the rotating marking head **34** in place to roll against a passing container to imprint the mark on the container. The second quarter cycle retracts the head to a source of ink. The third quarter cycle holds the head in place to receive a charge of ink, while the fourth quarter cycle returns the charged marking head to its original position over the path of travel of the containers to apply the mark to the next container in line.

Any suitable means may be provided for charging the marking dies **35** of the head **34** with ink for the marking operation. However a preferred means as disclosed in the drawings comprises a trough or reservoir **55** which is disposed remote from the path of travel of the containers B and in line with the axis of the head shaft **37**. The reservoir preferably is mounted on the bracket **39**. A freely rotatably wheel **56** mounted on a short shaft **57** carried in bearings in the reservoir is provided for frictional contact with the marking die **35** of the rotating marking head **34** when the head is in its retracted position, to carry up on its outer face fluid ink from the reservoir and apply the ink to the die for application to the containers.

When the mark is applied to the top face of the container flange C as shown in Fig. 7, provision is made to support or backup the projecting flange as the containers pass through the marking station. This is accomplished by an angularly disposed backing up or support wheel **61**

(Figs. 2, 3 and 4) having a beveled outer face **62** which is disposed immediately under the path of travel of the projecting flange C of the advancing containers B. The wheel **61** is mounted on a short shaft **63** mounted for free frictional rotation in bearings formed in a lug **64** on the ink reservoir **55**. The face **62** of the wheel **61** engages under the flange C of the passing containers and lifts them slightly to insure contact with the marking die **35** on the rotating marking head **34**.

In a modified form of the invention as disclosed in Fig. 6 a different manner of reciprocating the head shaft **37** is utilized. Otherwise the manner of feeding the containers B, the timing and the result are substantially the same as in the preferred form. In the modified form, the head shaft **37**, in part, is slidably and rotatably keyed in a hub **71** of a gear **72** which is journaled in a bearing **73** formed on the bracket **39**. The gear **72** meshes with and is driven by a gear **74** carried on a drive shaft **75** disposed in parallelism with the head shaft **37** and journaled adjacent its ends in bearings **76** of the bracket **39**. The driver shaft **75** is rotated by a sprocket **77** keyed to one end of the shaft and actuated by an endless chain **78** driven form the main shaft **31** as in the preferred form of the invention. Through this connection the marking head **34** is rotated in time with the advancement of the containers as in the preferred form of the invention. However the ratio of the gears **72, 74** is such as to effect two revolutions of the head shaft **37** for each single revolution of the drive shaft **75**.

Reciprocation of the head shaft **37** and the marking head **34** during their rotation is effected in this modified form of the invention by a lever **81** which is mounted intermediate its ends on a pivot pin **82** secured in the bracket **39** at a location midway between the head shaft **37** and the drive shaft **75**. One end of the lever carries a pin **83** which engages in a groove **84** of a collar **85** mounted on and rotating with the head shaft **37**. The opposite end of the lever carries a pin **86** which operates in a cam groove **87** of a barrel cam **88** mounted on and rotating with the drive shaft **75**.

Hence as the drive shaft **75** rotates the cam **88** through one revolution for each passing container B, it rocks the lever **81** to shift the head shaft **37** through a marking head retracting movement and a return movement with a dwell between each movement to effect the same result as in the preferred form of the invention.

It is thought that the invention and many of its attendant advantages will be understood from the foregoing description, and it will be apparent that various changes may be made in the form, construction and arrangement of the parts without departing from the spirit and scope of the invention or sacrificing all of its material advantages, the form hereinbefore described being merely a preferred embodiment thereof.

I claim:

Mechanism for marking articles such as containers and the like with an identifying legend, comprising a conveyor for feeding the containers in spaced relation to and through a marking station, an inking device at an inking station disposed adjacent said marking station in spaced relation thereto, a shaft movable axially relative to said stations, means for rotating said shaft continuously in time with said conveyor, a marking die on said shaft and a cam on said shaft, said cam having a pair of grooves having spaced parallel sections and connecting sections which cross each other, and a stationary element operating in said grooves to shift said shaft, cam and die as a unit first in one axial direction upon one revolution of said shaft and then in an opposite direction upon a second revolution of said shaft, whereby said one shaft revolution holds said marking die in alignment with said inking device to receive a supply of ink and thereafter shifts said die laterally into alignment with a container to be marked at said marking station, and said second shaft revolution holds said mark-

ing die in alignment with said container for marking the latter and thereafter shifts said die laterally back into alignment with said inking device to receive ink for a subsequent container marking operation.

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