UNITED STATES PATENT OFFICE

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ARTICLE-CONTROLLED MARKING MEANS:


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7 Claims. (Cl. 101—35).

This invention relates to apparatus for automatically marking a succession of moving articles, and is particularly suitable for apparatus for making batch markings on the lids of filled cans as they leave a filling machine on a conveyor.

According to this invention an apparatus for automatically marking a travelling succession of articles comprises a marking device, a drive therefor, a trigger mechanism arranged to render said drive operative or inoperative, and adapted to be engaged and released by each article in its passage past it, whereby the marking device operates on the articles in synchronism with their passage through the machine. It will be appreciated with this arrangement that the apparatus is automatically controlled by the movement of the articles through it, and is independent of the spacing of the articles apart, and thus variations in the spacing will not affect the positions of the markings on individual articles.

Preferably, the aforesaid drive is operated by a part of the mechanism which traverses the articles past the marking device, which arrangement ensures that the marking of the articles is unaffected by changes of speed of the traversing mechanism. For example, in a machine embodying a belt conveyor, the aforesaid drive may comprise a wheel arranged frictionally to engage said belt conveyor, and means for transmitting the rotation of the wheel to the marking device.

The drive may also comprise a friction clutch capable of slipping and the aforesaid trigger mechanism is arranged to lock and release another part of the drive between the marking device and the friction clutch, whereby, when the trigger mechanism is not engaged by an article the drive is locked and the marking device is stationary. However, as soon as the trigger mechanism is engaged by an article the drive commences and the marking device is arranged to engage the article as it moves past it.

The marking device may comprise a rotating holder for type or the like, and is driven at such a speed that its tangential velocity is equal, or nearly equal, to the velocity of the articles thereby preventing smudging.

The type holder is preferably arranged to be readily detachable from or assembled with a rotating shaft of said drive so that a new mark may be quickly assembled in the apparatus, possibly without stopping the machine, which new mark may be required for a different batch of articles. For this purpose, the holder may be held on its shaft by a spring detent.

The type in said holder may be arranged during the rotation of the latter to be brought into engagement with an inking roller.

The inking roller may be mounted to rotate freely on a spindle and is given a step-by-step rotation by engagement with said moving type so as to bring a fresh part of the roller on to the type in successive operations.

The roller may be mounted within a casing having an opening through which said type is brought into contact with the roller, and a closure member is associated with the opening so that when the apparatus is not in use the ink on the roller is kept from deterioration. The marking device and its drive are so arranged that the former may be adjusted towards and away from the path of travel of the article, so that the apparatus is applicable to marking different sized articles.

Preferably, the marking device, its drive and the trigger mechanism are constructed as a unit capable of ready attachment to a machine over a conveyor for said articles.

The following is a description of one embodiment of the invention arranged for marking the lids of cans as they leave a filling machine, reference being made to the accompanying drawings, in which—

Figure 1 is a perspective view of the apparatus; Figure 2 is a cross section through the type holder spindle; Figure 3 is a longitudinal section through the holder; Figure 4 is a section through the inking roller and its casing taken along the plane 4—4 of Fig. 5; and Figure 5 is a section on the line 5—5 of Fig. 4.

The apparatus comprises a bracket arm arranged for attachment to a part of the filling machine beneath the belt conveyor C which carries the filled cans away from the machine. The bracket arm extends beyond the edge of the belt and is provided with a block 11 in which is formed a square-sectioned socket for slidable engaging a square upright 12. The upper end of the upright is provided with a horizontally disposed bearing 13 through which extends a rotatable shaft 14. The shaft has secured to it on one side of the bearing a driving pulley 15 and on the other side an anchorage for a type holder 16. The aforesaid block is also provided with a vertically disposed screw-threaded bore which is engaged by a threaded adjusting shaft 17 which is rotatably mounted at its other extremity in the aforesaid bearing member, but is
fixed against axial movement therein by two collars 18 and 19. The lower extremity is provided with a manipulating knob 20 and thus by rotating the knob the aforesaid shaft 17 and its type holder anchorage may be moved towards and away from the belt conveyor. That part of the block which embraces the square-sectional upright is split at 21 and is provided with a clamping bolt 22, whereby the frictional engagement between the block and the upright may be adjusted. A weighted cantilever arm 23 is provided to swing about the aforesaid horizontally-disposed shaft 14, and for this purpose is provided with a forked extremity 24 which straddles the aforesaid bearing member 13 and is provided with holes through which the shaft 14 extends. The other extremity of the cantilever arm is provided with a bearing 25 through which a second horizontally disposed shaft 26 extends. Secured to this shaft on one side of the bearing is a friction clutch including a disc 21 provided on the outside face thereof with a friction lining, and rotatably mounted on the shaft is a pulley wheel 28 having a face thereof maintained in engagement with the friction lining by means of a compression spring 29 which encircles the shaft and abuts at one end against an adjustable collar 30 on the shaft and at the other end abuts against a thrust bearing 31 disposed between it and the pulley wheel 28. A flexible belt 32 is arranged to encircle the two pulleys 28 and 15. Secured to the second shaft 26 on the opposite side of the bearing to the pulley is a comparatively heavy friction wheel comprising a metal boss 33 having a groove formed therein in which is mounted a rubber ring 34 arranged to engage the belt conveyor, the weight of the cantilever arm and the boss ensuring sufficient frictional engagement between the ring and the belt conveyor. Mounted on an extension 37 of the aforesaid block 11 and in an extension 38 of the bearing 13 at the upper end of the aforesaid upright. The upper end of the oscillatable shaft is provided with a detent arm 39 which may be swung into and out of the path of movement of the extremities of the trigger arm 35 on the aforesaid pulley. A spring wire 40 is arranged to extend downwardly from the extension on the aforesaid upper bearing member and is arranged to engage the shank of a set-screw 41 carried by a sleeve 42 which is vertically adjustable along the oscillatable shaft by releasing and tightening said set-screw, as well as being rotatably adjustable thereon. The spring wire is so shaped as to exert a torque in the clockwise direction on the set-screw, thereby urging the detent arm into the path of movement of the aforesaid trigger arm. Also rotatably and longitudinally adjustable on the oscillatable shaft is a socket member 43 having a horizontally extending screw-threaded bore which carries a threaded rod 44 which projects into the path of movement of the articles on the conveyor band. The extent of the projection of the rod across the width of the conveyor band may be adjusted by rotating the threaded rod in the threaded socket by means of the manipulating knob 45, a clamp nut 46 being provided for holding the rod in any desired position. The height of the rod above the belt may be adjusted by the movement of the socket on the oscillatable shaft.

It will be appreciated with this arrangement that the detent arm 39 normally engages one end of the trigger arm 35, but so soon as the rod 44 is engaged by a flanged cam approaching the marking device the detent arm 39 is swung away against the action of the spring 40, thus permitting the upright shaft 36 to rotate. By the time the cam has come out of engagement with the rod 44 the cam will have been marked and the detent arm will spring back in time to engage the other end of the trigger arm.

The type holder 16 (see Figures 2 and 3) is provided with a bore 47 which is an easy sliding fit on the upper horizontally extending shaft 14 and which has a slotted projection 48 on each thereof, each capable of holding rubber type T removably inserted therein. A pin 49 is arranged to extend axially from one of the projections and engages a hole in a collar 50 which constitutes a part of the type holder anchorage. The collar is provided to one side thereof with a circumferential groove 51 which partly intercepts the hole which engages the pin. A spring ring 52 is mounted in this groove and is arranged to engage a notch formed in one side of the pin, thus forming a spring detent. The type holder also includes a bush provided with a suitably shaped gripping piece 53, whereby it may be readily slid on to and off the shaft.

The bearing at the upper end of the aforesaid square-sectional upright is provided with an extension 54 to one side of the bush which carries the upper shaft 14, which upward extension carries an eccentric bush 55 rotatable in the extension and provided with a set-screw 56 for locating it in a required angular position. A spindle 57 is arranged to extend horizontally through the extension bush and is formed with a flat surface 58 which is engaged by a set-screw 59, whereby the spindle may be adjusted in an axial direction and may be fixed in a desired position against rotation by means of a set-screw. Secured to the end of the spindle is a container for an inking wheel. The container comprises a disc 60 having a circumferential rim 61 which is slotted so as to permit the type, during the rotation of the type holder to project through the rim. The disc is provided with a central boss 62 by which it is attached to the spindle 57. A disc 62 and cut-away rim portion 63 are nested within the rim 61 and are provided with a central spindle 64 on which an inking roller 65 is freely mounted. The end of the spindle 64 is arranged to extend into a bore formed at the end of the spindle 57. By relatively rotating the nested portions the inking roller may be entirely enclosed between them, when the apparatus is not in use, as set out above. The inking roller may comprise a disc of wood around which is secured a felt band 66, which wood disc is provided with a central metal bush 67. The felt band may be brought into the required engagement with the type by adjustably rotating the aforesaid eccentric bush 55.

With the above arrangement, the inking roller cannot be assembled on the machine unless it is engaged in the above manner.
gage said belt so as to be driven thereby as the belt travels, a marking device, a drive for said marking device actuated by said wheel and embodying a clutch, a trigger mechanism adapted to arrest said device and to render inoperative the drive of the marking device by the clutch, which trigger mechanism is arranged to be operated by the passage of each article past it as it is moved by said belt so as to release said device.

2. An apparatus for automatically marking a succession of articles traversed by a conveyor belt, comprising a wheel arranged frictionally to engage said belt so as to be driven thereby as the belt travels, a marking device, a drive for said marking device actuated by said wheel and embodying a slipping friction clutch, trigger mechanism adapted to arrest the marking device and to render inoperative the drive of the marking device by the clutch, and tripping means for said trigger mechanism actuated by the passage of an article as it is moved by said belt past the trigger mechanism.

3. An apparatus for automatically marking a travelling succession of articles on a conveyor comprising a support adapted to be attached to a fixed part of the conveyor, a rotatable marking device, a spindle carrying the marking device, a pulley on said spindle and an arm articulatedally mounted on said support, a friction wheel rotatably mounted on said arm and adapted to engage frictionally a travelling surface of the conveyor, a pulley attached to the friction wheel, a belt connecting the two pulleys, a friction clutch disc mounted for rotation with said friction wheel and engaging said second-mentioned pulley, a trigger mechanism normally adapted to hold the first-mentioned pulley so that said clutch disc slips, which trigger mechanism is provided with a part arranged in the path of movement of said articles as they are moved by said conveyor and when engaged by an article releases said first-mentioned pulley.

4. An apparatus for automatically marking a succession of articles on a travelling carrier, comprising a marking device, means including a slip clutch for moving said marking device into engagement with each article as it passes the marking device, said means also including means engaging the carrier for driving the clutch at a speed proportional to that of the carrier, a trigger mechanism adapted to arrest said device and to render inoperative the drive of the marking device by the clutch, said clutch permitting continued rotation of said driving means and trigger-releasing means actuated by each article as it moves past said last-mentioned means on said carrier.

5. The apparatus defined by claim 4 characterized by said marking device including a printing member rotatively mounted adjacent said carrier.

6. The apparatus defined by claim 4, characterized by said marking device including a rotatable spindle, a type holder mounted thereon and a drive connecting said clutch to said spindle.

7. An apparatus for automatically marking a succession of articles moved by a conveyor belt, comprising a marking device, means engaging the belt for driving said marking device at a speed proportional to that of said belt, said means embodying a clutch, a trigger mechanism arranged to arrest said marking device and to render inoperative the drive of the marking device by the clutch, which trigger mechanism is arranged to be operated by each article as it is moved past the trigger mechanism by said belt so as to release said device.

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