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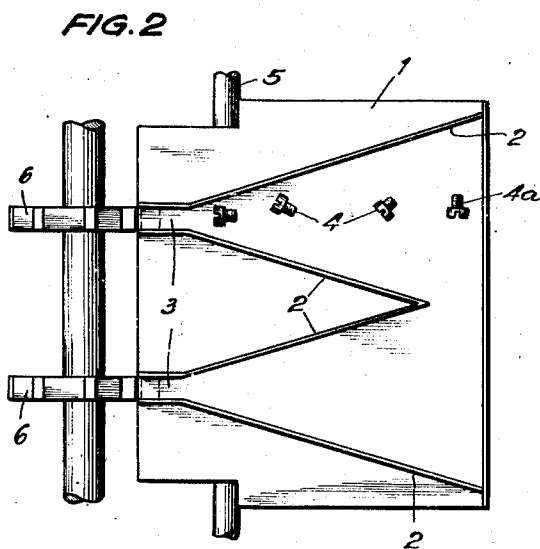
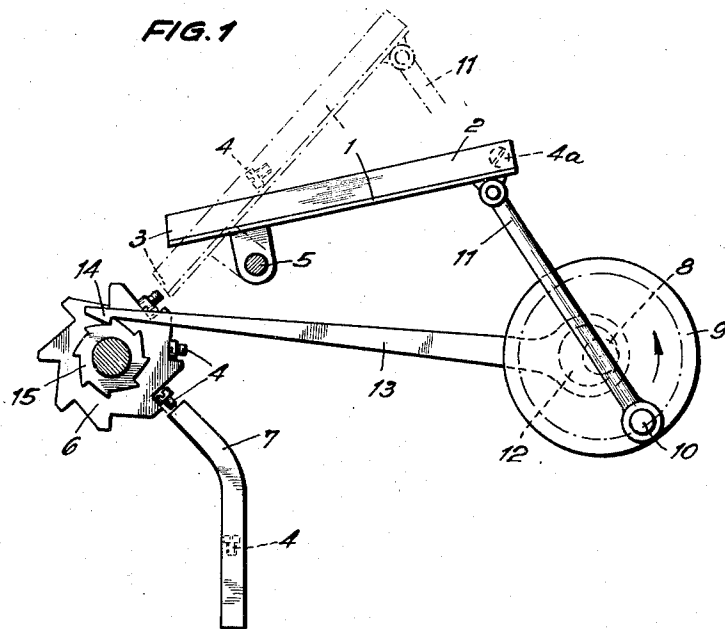
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APPARATUS FOR FEEDING OF PIN-SHAPED BODIES
WITH A ONE-SIDED CENTER OF GRAVITY

Filed June 3, 1952

2 Sheets-Sheet 1



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FIG. 3.

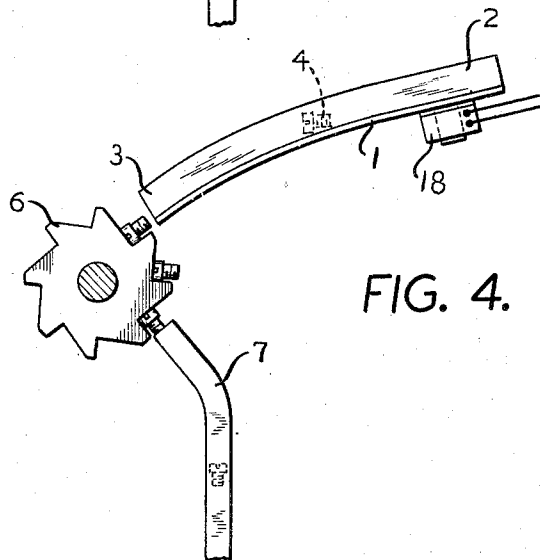
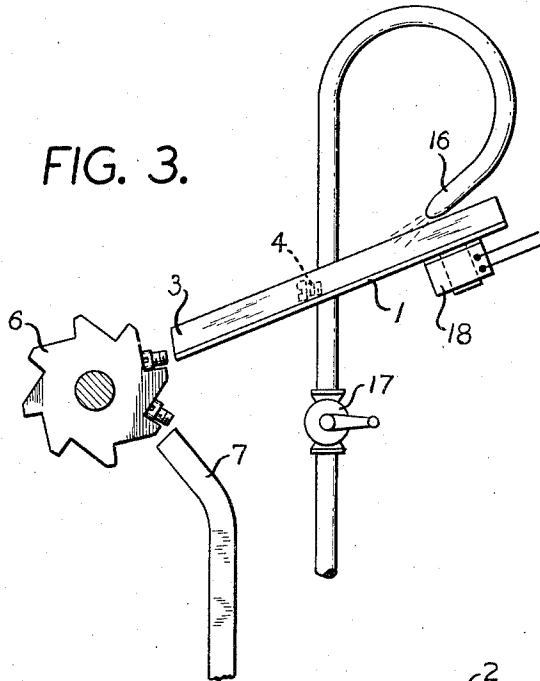


FIG. 4.

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APPARATUS FOR FEEDING OF PIN-SHAPED BODIES WITH A ONE-SIDED CENTER OF GRAVITY

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3 Claims. (Cl. 221—171)

This invention concerns a means for arranging pin-shaped bodies having an unsymmetrical center of gravity.

It is already known to use an inclined plane having an aperture therein for arranging pin-shaped bodies having an unsymmetrical center of gravity, such as nails. The bodies which slide down heavier end first fall in this position through the aperture into a further sliding guide which conveys them to where they are required for use or to a packing station. The bodies which come down with their lighter end first shoot across the aperture and are segregated or sent back over the slide. In another known arrangement the bodies are moved so slowly on the slide by accompanying guiding members that they all drop through the aperture with the heavier end first. Other devices again have special stops, return guides, deflecting means or the like in order to direct all the bodies in the right position.

It is, therefore, one object of the present invention to provide a method of arranging pin-shaped bodies having an unsymmetrical center of gravity which method is distinguished by extreme simplicity.

It is an object of the present invention to provide an apparatus for feeding of pin-shaped bodies with a one-sided center of gravity which includes an inclined plane for the directing of said pin-shaped bodies with an unsymmetrical center of gravity and a correspondingly larger end, especially headed screws, and which has such an incline and length that the bodies, preferably placed on it in a transverse position to the inclination of the plane, swing out freely in their motion along the same into a position with the heavier end (with screws with the head end) downwards. The reliability of the proposed apparatus is increased if steps are taken in addition to accelerate the longitudinal motion of the bodies over the inclined plane from a slow motion at the beginning of the swinging out to a fast one at the end of the swinging out. This can be done by exposing the individual bodies in their motion over the plane to a current, preferably increasing, of a liquid or gaseous conveying means. The swinging out can also be accelerated and their stopping on the surface prevented if the bodies are jolted in their path over the plane.

It is yet another object of the present invention to provide an apparatus for feeding of pin-shaped bodies with a one-sided center of gravity which includes a slide which is preferably used as an inclined plane which is provided with funnel-shaped converging guiding walls standing on it, of which the spaced intervals from one another at the outlet of the slide just exceed the greatest diameter of the bodies.

For certain purposes of use it is of advantage if at the outlet of the slide a tipping device, preferably a conveyor wheel, is disposed which gives up the bodies arriving with their larger end (head end) first (i. e. headed screws) in the reverse position i. e. with the light end

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first, to a further path of conveyance, i. e. a conveyor pipe.

In order to accelerate additionally the longitudinal motion of the bodies during the swinging out, the gradient of the slide being used as an inclined plane can increase towards the outlet. It is of advantage if, the slide, serving as an inclined plane, is inclinable on a transverse axis and is tipped backwards and forwards in time with the passage of the individual bodies by suitable control means.

The slide and tipping device such as a conveyor wheel may be driven intermittently in synchronism with one another by a pace-changing mechanism or the like.

With these and other objects in view which will become apparent in the following detailed description, the present invention will be clearly understood in connection with the accompanying drawings, in which:

Figure 1 is a diagrammatic side elevation;

Fig. 2 is a plan view;

Fig. 3 is a diagrammatic side elevation of the apparatus with means for supplying an air current to the inclined plate; and

Fig. 4 is a diagrammatic side elevation of the device indicating an inclined plate having an increased gradient at its outlet zone.

The slide 1 has separating walls 2 standing vertically thereon, which form in the example illustrated two funnel-shaped converging guides—there can be several guides or only one—the outlet 3 of which is so small that it can only admit longitudinally directed headed screws 4 arriving one after the other.

Conveyor wheels 6 and the slide 1 oscillatable about the stationary axis 5 are so driven backwards by a step-by-step switch mechanism that each outlet 3 in its lowest position discharges into a trough of the conveyor wheel 6. The step-by-step switch mechanism contains a driving shaft 8 on which is stationarily fixed a disc 9 to the crank pin 10 of which the push rod 11 is pivoted which with its other end engages the slide 1. Moreover, the shaft 8 carries an eccentric 12 for taking up the switch rod 13 which cooperates with its finger 14, with the switch wheel 15. The switch finger 14 is in the diagrammatic form shown held in engagement with the switch wheel 15 by its weight.

Thus the conveyor wheels 6 and the slide 1 are so coupled together that during the to and fro motion of the slide the conveyor wheel is further rotated by one division. A discharge pipe 7 is associated with each of the conveyor wheels 6. The cross section of each pipe 7 is of such size that it allows space for screws arriving separately one behind the other only and prevents their tipping over.

The operation of the whole apparatus described above is as follows:

By rotation of the driving shaft 8 in the direction of the arrow the switch wheel 15 together with conveyor wheel 6 is rotated through one tooth division by means of eccentric 12 and switch rod 13. Simultaneously by means of the crank drive 9—11 the slide 1 is inclined even more steeply, till it assumes the position shown in dotted lines in Fig. 1 after the conveyor wheel 6 has meanwhile come to rest, and the switch rod 13 has started on its back path, in order to introduce a new switch step.

The turning outwards of the headed screws by means of the apparatus described and illustrated in the drawing occurs as follows:

The slide 1 in the backward inclined position receives the headed screws 4 which are preferably arranged or supplied by suitable means in such a way that their longitudinal axis is situated transversely to the direction of the gradient of the slide. The screw then swings out of this transverse position (corresponding to 4a) during its longitudinal motion on the slide 1 into a position in

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which its head end points downwards. In order not to allow it to come to a stop, the slide 1 meanwhile is tilted forwards until the outlet 3 points to the corresponding trough of the conveyor wheel 6. In this way the screw slips down over the slide and falls through the outlet 3 into the trough of the conveyor wheel 6 which takes it along and sends it away shank first into the discharge pipe 7 which conveys it to an assembly point for use.

In addition to or instead of the tipping motion of the slide 1, a jolting motion can be provided in order to keep the screws in motion on the slide. The slide 1 can also be constructed with an increasing gradient towards the outlet 3, as shown in Fig. 4. Furthermore the screws can be kept in motion on the slide by being subjected to an air current or by a jet of water, as shown in Fig. 3. Instead of providing the crank drive 9—11, any other means may be provided for operating the slide 1, as for instance an electrically operated conventional vibrator 18 (Figs. 3 and 4).

While I have disclosed several embodiments of the present invention, it is to be understood that these embodiments are given by example only and not in a limiting sense, the scope of the present invention being determined by the objects and the claims.

I claim:

1. In an apparatus for feeding pin-shaped bodies, the combination of a plate having a flat upper non-perforated face, means supporting said plate in inclined position, said plate being of a length many times that of said pin-shaped bodies in order to permit of said bodies to swing out freely with their larger end downwards during their accelerated downward travel along said inclined plate, means for subjecting said plate to a reciprocating movement from a lesser inclined position to a greater inclined position within a predetermined cycle in order to provide an accelerated feeding movement for said bodies, a plurality of walls substantially perpendicular to and extending upwardly from the upper face of the said plate, each pair of said walls converging towards one another in a downward direction and substantially for the entire length of the said plate to provide at their lower end an outlet zone for the said bodies fed to the upper portion of the said plate, the minimum space between each pair of said walls being in the outlet

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zone for the said bodies and slightly larger than the diameter of one of said bodies, with a rotatable conveyor device disposed adjacent the said outlet zone of the said walls, the said conveyor device receiving said bodies head first and releasing said bodies head last during its rotating movement, means for rotatably supporting said conveyor device and means for advancing said conveyor device in synchronism with said tilting means in such manner that the receiving position of said conveyor device corresponds with the most inclined position of said plate, and said conveyor device having a plurality of pockets peripherally spaced apart from each other and receiving successively said pin-shaped bodies head first and releasing said pin-shaped bodies head last after performing a rotating movement along a predetermined angle.

2. The apparatus, as set forth in claim 1, which includes a second conveyor device disposed adjacent said first conveyor device and comprising a substantially tubular member of a diameter less than that of said pin-shaped bodies and receiving and feeding the latter head last therethrough by gravity.

3. The apparatus, as set forth in claim 1, wherein said plate has an increased gradient towards the said outlet zone.

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