Sept. 2, 1969 B. ALBECK ET AL 3,464,535

FEEDING APPARATUS FOR HEADED PINS, SPIKES, OR THE LIKE

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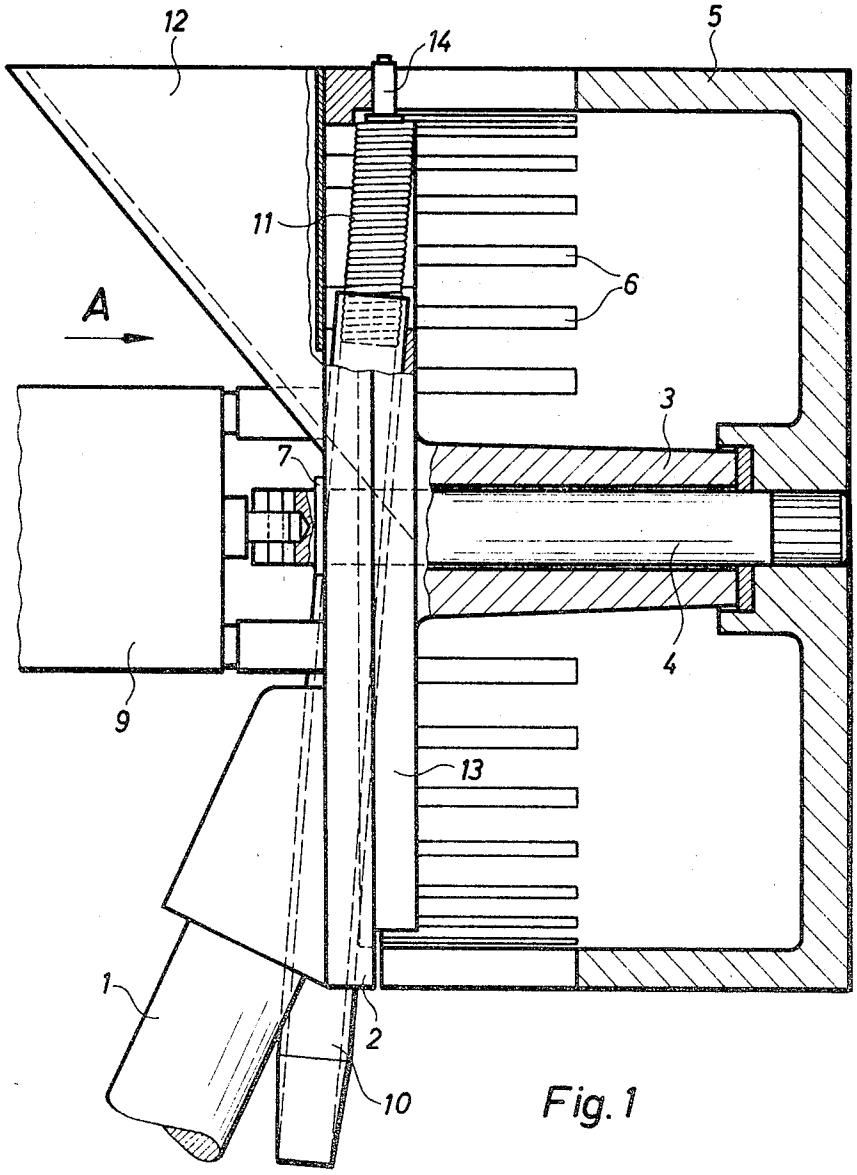

Fig. 1

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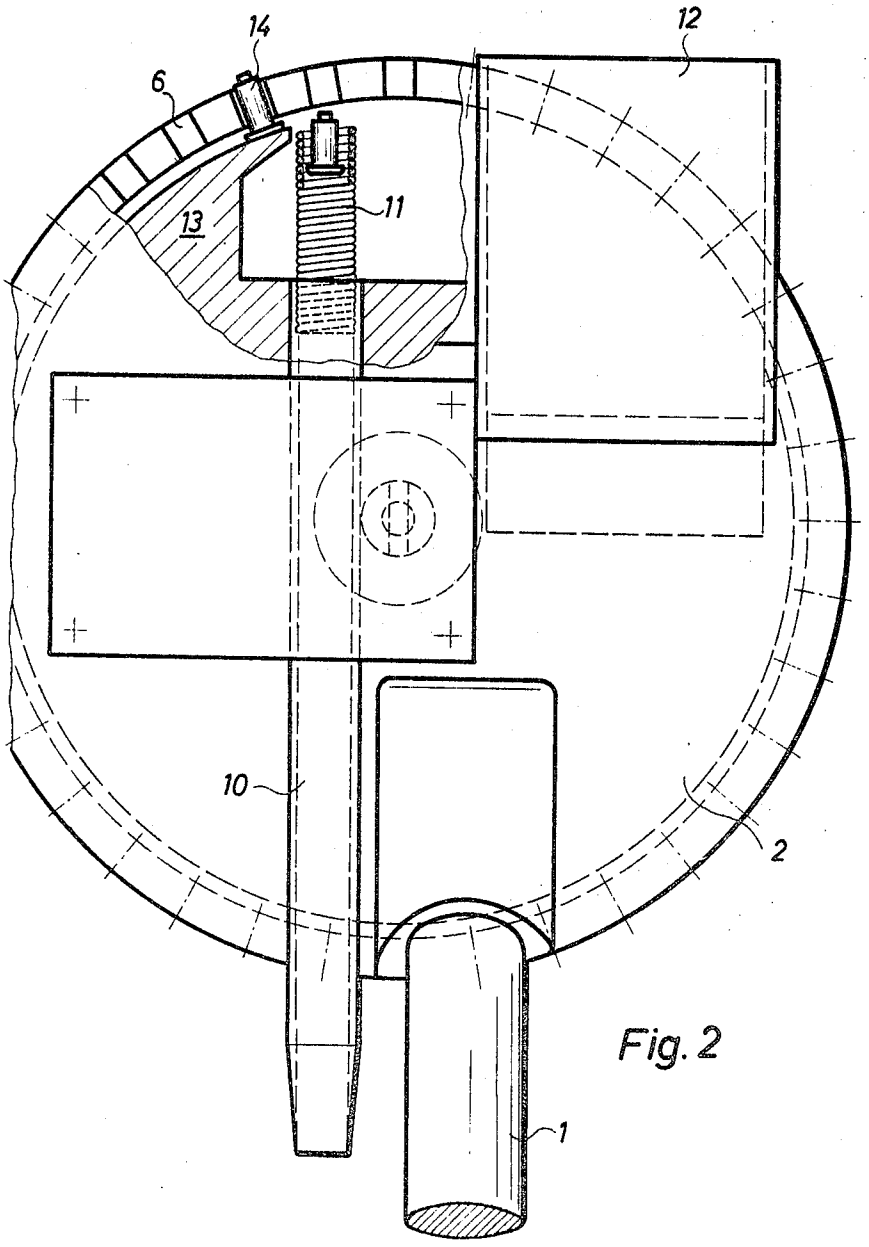

Fig. 2

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FEEDING APPARATUS FOR HEADED PINS, SPIKES, OR THE LIKE

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U.S. Cl. 198—33 4 Claims

ABSTRACT OF THE DISCLOSURE

A feeding drum for headed pins, screws, spikes or the like which is rotatable about an inclined axis and provided with parallel slots in its peripheral wall into each of which, due to the tumbling movement of the spikes within the drum, the shank of at least one spike enters during each revolution of the drum and, because of the inclined position of the drum, this spike then slides to the lowest part of the slot into an arcuate gap between the inner wall of the drum and a stationary flange along which the head of this spike slides during the further rotation of the drum until it reaches the upper end of the flange when the spike will drop by gravity out of its slot into the open upper end of a delivery pipe.

The present invention relates to an apparatus for automatically aligning headed pins, rivets, screws, or the like, and especially spikes for automobile tires, and for feeding them in equal positions consecutively in the same direction.

It is an object of the present invention to provide a very simple and inexpensive feeding apparatus of the above-mentioned type which will feed the spikes or the like very reliably, in equal succession, and at any desired rate or frequency to the place where they are to be used.

For attaining this object, the feeding apparatus according to the invention comprises a drum which is open at one end and rotatable about an obliquely inclined axis on a stationary support forming a wall which covers the open end of the drum and is provided with an opening through which the spikes or the like are supplied from a hopper to the inside of the drum. According to the invention, the peripheral wall of the drum is provided with parallel longitudinal slots which extend from the open end of the drum adjacent to the stationary supporting wall for a certain distance toward the closed end of the drum and have a width slightly larger than the diameter of the shanks of the spikes or the like. The stationary supporting wall is provided with a guide flange which projects into the open end of the drum and is radially spaced therefrom so as to form an arcuate gap which has a radial width substantially equal to the axial thickness of the heads of the spikes or the like and a longitudinal width sufficient to receive the head of one spike in each slot. After passing from the hopper into the lower part of the rotating drum, the spikes will tumble around therein until their shanks will enter the slots automatically so as to point in outward directions, while their heads rest on the inner wall of the drum. Due to the inclination of the drum, the spikes will then slide by gravity within the lower part of the drum toward the stationary supporting wall and their heads will finally pass into the gap between the drum and the guide flange and they will then slide peripherally along the latter during the further rotation of the drum. The spike in each slot within the gap is thus taken along by the drum until it reaches the upper end of the guide flange.

When the head of each spike then slides off the edge of this guide flange, the spike will drop out of its slot and pass head first into the open upper end of an upright delivery pipe.

Since during each revolution of the drum, at least one spike or the like will enter each slot in the lower part of the drum and its head will then slide into the arcuate gap between the drum and the stationary guide flange and be taken along by the drum until it reaches the recess in the upper side of the guide flange adjacent to the open upper end of the delivery pipe, the spikes will drop in a regular succession from their slots into the delivery pipe and be fed head first at equal intervals through this pipe to the place where they are to be used.

Another object of the invention is to prevent any interference in the operation of the apparatus which may be due to the engagement of a spike or the like with the upper end of the delivery pipe or with the projecting end of a previous spike which has not as yet dropped entirely into the delivery pipe. For attaining this object, the invention provides that the delivery pipe or at least its upper end is made of a resilient construction so that a spike while still at least partly in its slot hits against the upper end of the delivery pipe or against the upper end of a preceding spike which has not fully dropped into the upper end of the delivery pipe, the latter will be bent resiliently in the direction of rotation of the drum and the spike will thereafter drop out of its slot back into the lower part of the drum.

These as well as additional features and advantages of the present invention will become further apparent from the following detailed description thereof which is to be read with reference to the accompanying diagrammatic drawings, in which:

FIGURE 1 shows a longitudinal section of the essential parts of a feeding apparatus according to the invention; and

FIGURE 2 shows, partly in cross section, a view which is taken in the direction of the arrow A of FIGURE 1.

As illustrated in the drawings, the apparatus according to the invention which in this particular case is intended for feeding headed spikes which are to be inserted into automobile tires, comprises a perpendicular upright 1 on which a supporting wall 2 is mounted which extends within a plane which is disposed at an angle of approximately 25° to the upright 1. This supporting wall 2 carries integrally thereon a bushing 3 in which a drive shaft 4 is rotatably mounted one end of which is secured to the center of the wall of drum 5. The peripheral wall of drum 5 is provided with a plurality of slots of an equal length which extend parallel to each other and to the axis of shaft 1 and at equal distances from each other from the edge of the open end of the drum. The side walls of the slots 6 extend in radial directions of the drum. Drive shaft 4 projects through the supporting wall 2 and is provided on the other side thereof with a spring washer 7 for preventing it from shifting in its longitudinal direction relative to the supporting wall 2. The outer end of shaft 4 is connected by suitable means either directly or through a reduction gear to a motor or other driving means 9 which is mounted on the supporting wall 2.

The supporting wall 2 is further provided with a substantially diagonal bore which extends parallel to a diametrical plane of this wall closely adjacent to one side of shaft 2, but at an angle to the flat outer surface of wall 2 which is smaller than the angle at which this surface is disposed to the perpendicular upright 1. This bore contains a delivery or discharge pipe 10 which extends in the mentioned inclined direction. The lower end of this pipe projects beyond the peripheral surface

of wall 2, while its upper end extends into a recess in the upper side of wall 2. This upper end of delivery pipe 10 is resilient and may consist of a coil spring 11 which extends upwardly to a point near the inner wall of drum 5. The upper end of pipe 10 may, however, be made resilient in any other suitable manner or the entire delivery pipe 10 may be made, for example, of a resilient plastic or similar material. The side of wall 2 carrying the motor 9 also carries a funnel-shaped hopper 12, the lower end of which projects through an aperture in wall 2 into drum 5. The other side of wall 2 is provided with a guide flange 13 which projects into the slotted drum 5 and has a width approximately equal to the diameter of the heads of the spikes 14.

The spikes 14 which are fitted into the hopper 12 slide from the latter into the slotted drum and collect in the lower part thereof. Due to the rotation of the drum, the spikes then carry out a tumbling movement within the lower part of the drum with the result that sooner or later one or more spikes 14 will enter each slot 6 during each revolution of drum 5. Due to the inclination of the peripheral wall of drum 5, relative to the upright 1, the first of these spikes in each slot 6 will then slide by gravity near the lower side of the drum toward the fixed wall 2 and its head will pass into the annular gap between the inner wall surface of the drum and the outer peripheral surface of guide flange 13. Each of these spikes will then be taken along in its slot 6 by the further rotation of the drum, while its head will slide along the stationary guide flange 13 until it reaches the edge of the recess in the upper side of the flange and the spike 14 will then slide by gravity out of its slot 6 and drop head first into the open upper end of the delivery pipe 10, that is in the case as illustrated in the drawings, into the coil spring 11 through which it will then drop into and through the actual delivery pipe 10 and through a flexible delivery tube or the like (not shown) which may be connected to the lower end of pipe 10. All other spikes which might have entered the slots 6 in the lower part of the drum and are taken along by the latter without sliding along the guide flange 13 will usually drop out of their slots by gravity when reaching the upper part of the drum and fall back into the lower part of the drum where they will tumble around with the other spikes until they will again enter the slots 6.

In the event that the delivery pipe 10, 11 is full of spikes or clogged and the last spike which has dropped into this pipe still projects partly from the coil spring 11 in the manner as shown in FIGURE 2 when the next spike 14 reaches this point, this spike will engage upon the projecting end of the previous spike and bend the coil spring in the direction of rotation of the drum and will then drop out of its slot and back into the lower part of the drum after disengaging from the projecting end of the previous spike. Coil spring 11 will then snap immediately back to its normal position. The flexible upper end 11 of the delivery pipe will therefore prevent any spikes from being wedged together and blocking each other and thus any breakdown in the uniform rotation of the drum.

Although such a blocking interference between the spikes 14 which are still being conveyed by drum 5 and a spike projecting from the upper end 11 of pipe 10 may also be prevented by reducing the height of this end 11 without making it of a flexible construction, this would have the disadvantage that, if a spike might fall upon the upper edge of the delivery pipe, it might turn around and fall in the wrong position into the delivery pipe 10, 11.

Although our invention has been illustrated and described with reference to the preferred embodiment thereof, we wish to have it understood that it is in no way limited to the details of such embodiment but is capable of numerous modifications.

Having thus fully disclosed our invention, what we claim is:

1. An apparatus for feeding elements, each having a shank and a head on one end of said shank, in a head first position in the same direction, comprising a drum, means for mounting said drum so as to be rotatable about an obliquely inclined axis, means for rotating said drum, said drum having one closed end and an open end, means for feeding said elements into said drum, said mounting means comprising a stationary cover covering said open end of said drum and having a flange thereon projecting into said open end for a distance substantially equal to the diameter of the head of one of said elements and being radially spaced from the inner surface of the peripheral wall of said drum by a gap having a width slightly larger than the maximum axial thickness of said head, said peripheral wall having a plurality of slots parallel to each other and to said inclined drum axis and equally spaced from each other and extending from said open end in the direction toward said closed end, each of said slots having a width slightly larger than the diameter of said shank and during each revolution of said drum adapted to receive the shank of at least one of said elements tumbling around in the lower part of said drum, said shank then sliding by gravity toward said cover so that said head will engage into said gap and during the upward movement of said element in said slot slide along the peripheral surface of said flange, said flange having an upper end near the apex of the open end of said drum, and a substantially stationary substantially upright delivery tube at least partly projecting into said open end of said drum and having an open upper end peripherally adjacent to the edge of said upper end of said flange and adapted to receive said elements consecutively dropping by gravity out of said slots when their heads pass beyond said edge.

2. A feeding apparatus as defined in clause 1, wherein said slots also extend parallel to said drum axis and have substantially radially extending side walls.

3. A feeding apparatus as defined in clause 1, wherein at least the upper end of said delivery tube adjacent to the end of said flange is resiliently flexible.

4. A feeding apparatus as defined in clause 3, wherein at least said upper end of said delivery tube consists of a tubular coil spring.

References Cited

UNITED STATES PATENTS

3,054,170	9/1962	Benichasa.
3,297,131	1/1967	Pawlowski.

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