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R. M. INGHAM, JR., ET AL

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HANDLING ARRANGEMENT FOR BOBBINS AND THE LIKE

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3 Sheets-Sheet 1

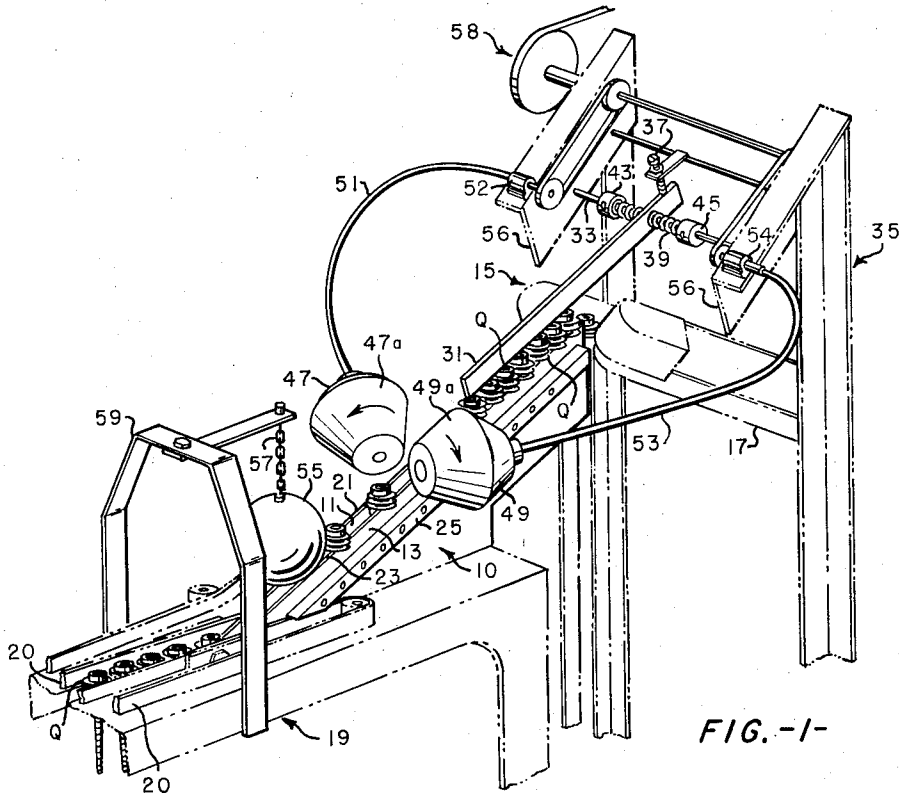


FIG. -1-

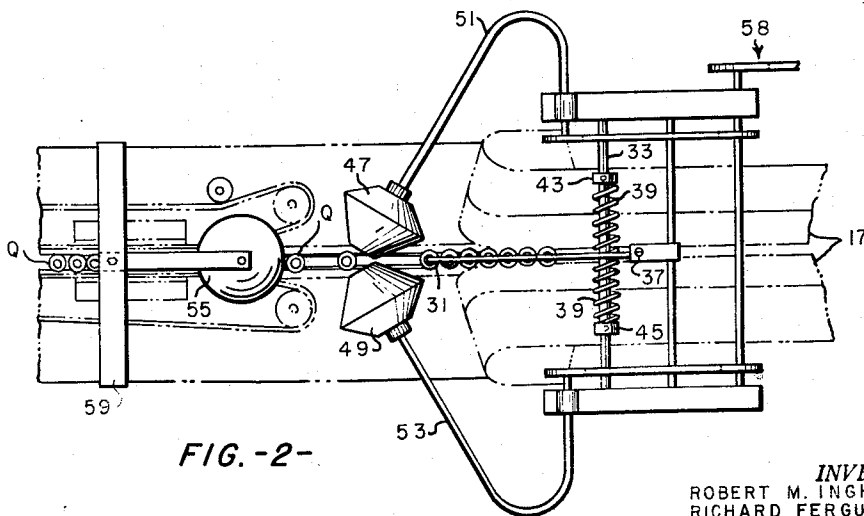


FIG. -2-

INVENTOR.
ROBERT M. INGHAM, JR.
RICHARD FERGUSON
JAMES L. BROWN

BY

Walter E. Muller
ATTORNEY

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R. M. INGHAM, JR., ET AL

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3 Sheets-Sheet 3

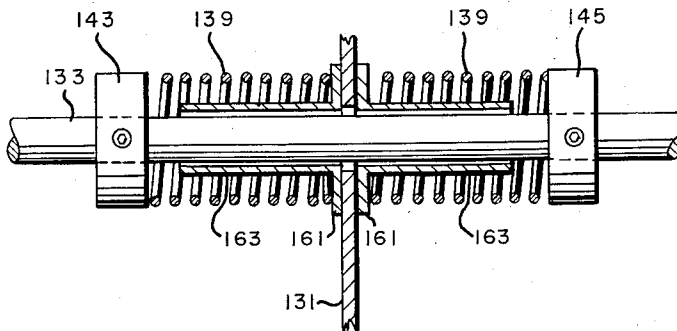


FIG. -5-

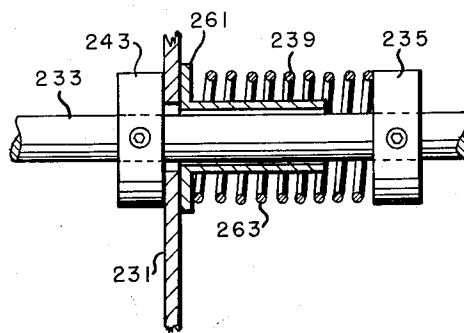


FIG. -6-

INVENTOR.
ROBERT M. INGHAM, JR.
RICHARD FERGUSON
BY JAMES L. BROWN

Walter E. Mueller
ATTORNEY

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HANDLING ARRANGEMENT FOR BOBBINS AND THE LIKE

Robert M. Ingham, Jr., Spartanburg, S.C., and Richard Ferguson and James L. Brown, Charlotte, N.C., assignors to Deering Milliken Research Corporation, Pendleton, S.C., a corporation of Delaware

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17 Claims. (Cl. 198—33)

This invention relates to bobbin or quill hold-down arm arrangements, particularly in combination with feed chutes of the type arranged for feeding or delivering articles such as quills or filling bobbins, having an enlarged head at one end of an elongated barrel and being fed in single file alignment while hanging from the heads thereof; and more particularly to an improved arrangement for a hold-down arm and feed chute arrangement of this sort which may advantageously be employed in combination with continuously driven conveyor by which articles fed at a relatively rapid rate by the conveyor to the chute can be handled effectively and delivered in an orderly fashion without undue operator attention.

There are frequent occasions when quill-shaped articles of the kind noted above must be delivered in regular order from a supply in which they are arranged at random, as in the feeding of spent or partially spent filling bobbins for subsequent cleaning thereof. Conveniently, a conveyor having a pair of spaced-apart inclined conveyor belts forming an open-bottomed feeder trough such as disclosed in co-pending applications Serial No. 411,480, filed February 15, 1954, now Patent No. 2,854,730 and Serial No. 482,077, filed January 17, 1955, now Patent No. 2,832,458 may be used to particular advantage for positioning such bobbins in single-file alignment and feeding them to a chute structure for delivery to a yarn cleaning or stripping device. In order to employ this conveyor most effectively, it should be operated so that the feeding rate or speed of the aligned bobbins is rapid enough to carry off each bobbin to the delivery chute as soon as it is aligned and thereby maintain the conveyor means continuously active in positioning succeeding bobbins for feeding.

However, when the bobbin feeding rate is sufficiently rapid for operation of the conveyor means to best advantage, difficulty is often encountered in handling the delivery of the bobbins to the cleaning device, because the conveyor is characterized by an upwardly inclined disposition and the delivery chute is normally inclined downwardly therefrom to direct bobbins received from the conveyor by gravity to the cleaning device, so that a change in direction of the rapidly fed bobbins must be effected at the chute entrance and a constant tendency of the bobbins to become misaligned and to jam during this change in direction must be overcome. The confining means should be arranged to accommodate freely the articles being fed so as not to impede the feeding; and it is of great advantage to employ a confining arrangement which will not only confine the properly aligned bobbins or quills but which will also tend to align partially aligned bobbins, and which particularly permits the movement therepast, or the movement completely out of the chute, of any bobbins or quills which are so grossly misaligned or misplaced as to otherwise pose a serious threat of jamming the quills as they move into engagement with the confining means.

It is accordingly an important object of this invention to provide an effective confining arrangement particularly

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adapted for use in combination with a downwardly directed chute and upwardly directed feeder conveyor as described above wherein the arrangement not only serves to guide quills or bobbins during their change of direction from the upwardly directed feeder conveyor onto and down the downwardly directed chute but which also is so arranged as to permit free discharge or passage thereby, substantially without jamming, of grossly misaligned or misplaced bobbins or quills particularly such as double-stacked or telescoped bobbins or quills (i.e. where the small end of one bobbin is lodged in the large end of another bobbin), or the like, and also bobbins having extra large bunches of yarn remaining thereon, such being known in the art as "pieces."

It is a further object to provide an apparatus which is not only effective to confine bobbins, quills or the like during a change of direction in the conveying path therefor and which permits the passage thereby of grossly misplaced, misaligned or overfilled quills, bobbins or the like, but which also has provision for actively removing and discharging grossly misaligned or misplaced bobbins or quills (including "pieces") or the like, as well as having provision for the seating of bobbins which are riding slightly high by virtue of support between two adjacent bobbins and which are not seated by the confining means first mentioned.

Still a further object is the provision of an apparatus wherein grossly misaligned or misplaced bobbins, quills or the like are actively discharged from a conveyor, particularly a gravity feed chute.

Still a further object is the provision of an apparatus for properly seating slightly high riding objects, particularly quills, bobbins or the like, which are supported in a slotted chute between two adjacent bobbins or the like as by the ring ferrules on filling bobbins or quills.

According to the present invention an arrangement is provided by which a predominant portion of articles being fed rapidly thereto can be handled effectively for orderly delivery, while allowing any of the articles that resist such handling unduly to escape immediately from the chute and thereby avoid interference with the other articles. Briefly described, in a preferred embodiment of the invention an arm member is disposed above and adjacent the upper end of a pair of spaced-apart inclined slide members which form a slot for receiving and slidably supporting articles being fed by their heads in single file alignment, the arm member being pivotally mounted on a substantially horizontal axis and also laterally swingably movable against the resilient centering action of a pair of compression springs which normally tend to hold the arm member in vertical alignment with the center of the slot and the single-file alignment of articles being fed. The arm member reaches from its pivot point downwardly toward the lower slide member ends so as to ride the heads of the articles as they are received at the upper ends of the slide members and thereby guide and position them properly for delivery movement to the lower end of the slide, while remaining yieldable, however, both vertically and laterally to allow escape adjacent the upper slide member ends or passage thereby of any articles that resist positioning unduly, as noted above.

In a preferred embodiment of the invention the hold-down arm is also arranged to collect successively the rapidly fed articles as they are received by the feed chute and retains a progressive group of these articles beneath the pivoted arm member adjacent the upper end of the slide member so that each successive article of this group is released only upon displacement from beneath the arm member by the feeding pressure of succeeding articles at the rear of the group and is thereby controlled, despite the rapid feeding rate of the articles being received, to be delivered by gravity in an orderly manner at the lower

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end of the feed chute, as to a bobbin or quill cleaning or stripping device.

Disposed beyond the lower extending end of the hold-down arm means in the form of a pair of tapered positively driven rolls, disposed above and aligned with the chute, there are provided two rotatably driven kicker discharge rolls which actively remove and discharge any high-riding bobbins which pass by the hold-down arm and which are not discharged of their own accord before reaching these positively driven rolls. The rolls are preferably so disposed above the chute as to permit slightly high riding bobbins which are otherwise properly aligned and may be properly seated through slight further action thereon, to pass therebeneath without discharging the same. These bobbins which are only held above their normal seated position by support between two adjacent bobbins are then properly seated through the action of an overhead resiliently movable retarding means in the form of a weighted depending ball. The ball tends to retard the slightly high-riding bobbins thus permitting the immediately preceding supporting bobbin to move slightly ahead in the normal feeding action thereof, whereupon the slightly high-riding bobbin is then unsupported on its forward side and is thus in a position to properly seat itself either substantially immediately in the event that bobbins having no ferrules thereon are employed or slightly thereafter upon the bobbin pushing the ball ahead somewhat and moving slightly therebeneath.

The preferred order of arrangement of the various individual elements of the overall combination apparatus, is in the sequence given in the foregoing brief description, namely the downwardly extending pivotally mounted arm, the discharge rolls, and then the depending seated ball, although other sequences may be desirable in some instances.

Still other objects and many attendant advantages and features of the invention will become apparent from a reading of the following detailed description of a preferred embodiment and several modifications according to the invention, taken in conjunction with the accompanying drawings, wherein:

Figure 1 is a schematic perspective view illustrating a preferred embodiment of the invention.

Figure 2 is a similar perspective view illustrating the lateral movement of the hold-down bar during passage thereby of a telescoped bobbin.

Figure 3 is a perspective view illustrating several quill or bobbin conveying defects which are handled and taken care of by the instant invention according to the preferred embodiment thereof.

Figure 4 is a schematic side elevation illustrating further quill or bobbin conveying defects which are handled by the preferred embodiments of the invention.

Figures 5 and 6 illustrate in fragmentary schematic section two modifications of the pivotal mounting arrangement for the hold-down arm.

Referring in detail to the drawings, a feed chute 10 comprising a pair of vertically disposed side plates 11, 13 is arranged for use in delivering spent quills or bobbins Q from a trough-shaped open-bottomed upwardly inclined belt conveyor 15 including a pair of mutually inclined upwardly extending friction-conveying belts 17 of the type disclosed in the above noted co-pending applications, as indicated in broken lines on the figures, to a stripping or cleaning apparatus indicated in broken lines at 19 and having a pair of driven bobbin conveyor belts 20, which stripping apparatus may desirably be of a type such as disclosed in U.S. Patent No. 2,149,788 to J. E. Kimbirl. The vertical side plates 11, 13 of the feed chute 10 have downwardly sloping upper edges 21, 23 which serve to slidably support the enlarged head end of the depending quills Q for sequential progressive downwardly movement in the slot formed between the two side plates 11 and 13. The slot formed between the two side plates

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11, 13 of the chute 10 is disposed in alignment with the slot formed between the two mutually inclined spaced-apart continuously driven belts of the conveyor 15, and the chute 10 thus serves as a gravity conveyor between the dynamic friction-conveying belt conveyor 15 and the stripping or cleaning apparatus 19, which also has its entrance slot in alignment with the slot between the plates 11 and 13. The side plates 11, 13 each also serve to prevent successive lateral tilting of the bobbins Q in order to alleviate the occurrence of alternate tilting or "chop-sticking" of the depending bobbin barrels, which would materially impede the entry of the bobbins into the quill stripping apparatus 19. In order to maintain rigidity in the side plates 11 and 13 an angle bar or other brace member 25 may be longitudinally arranged and secured to the outer surfaces of each of these side plates, if desired.

As will be apparent to one skilled in the art the plates 11 and 13 may be suitably mounted on any desired framework as on the entrance end framework of the stripping apparatus 19, and since such is only a matter of choice and conventional mechanical skill the particular mounting arrangement therefor will not be described in detail.

The bobbins Q usually reach the delivery end of the belt conveyor 15 spaced from one another at more or less irregular intervals, this spacing normally being an indeterminate variable depending upon the rate at which bobbins Q are supplied to the conveyor belts 17 for alignment and feeding. In any case the aligned bobbins will be travelling rapidly as they are delivered to the feed chute 10, and special provision must be made for receiving and handling these rapidly traveling bobbins Q in the feed chute 10 for delivery to the stripping apparatus 19. Further, a substantial number of these bobbins Q may not be properly aligned, nor may it be possible to properly align them after they leave the conveyor 15, and it is therefore important that the handling means employed in conjunction with the chute 10 be also capable of operation without jamming as a result of such misaligned or misplaced bobbins being fed thereto by the belt conveyor 15.

To this end, a pivoted arm member 31 is arranged above the upper entrance ends of the feed chute slide member 11, 13 and normally in alignment with the feeding direction of the aligned bobbins Q so as to ride the heads of the bobbins Q for positioning them properly on the slide providing that such bobbins Q are not so grossly misaligned or misplaced as to prohibit their proper positioning in the slot formed between the side plate members 11, 13. The arm member 31 is pivotally supported on a substantially horizontal transverse shaft 33 which is in turn supported in any suitable manner in spaced-apart relation above and preferably rearwardly of the entrance end to the chute 10, as on a bracket framework generally indicated at 35. The particular individual mounting for the pivot support is obviously a matter of mechanical design and may be varied as desired to fit the needs of the individual case. The spacing of the pivot support shaft 33 rearwardly of the entrance end of the chute 10 thus provides a horizontal pivot axis for the arm member 31 in advance of the entrance end of the feed chute 10, such that the arm member 31 may extend forwardly and downwardly toward the lower end of the guideway formed by the inclined surfaces 21, 23. The arm 31 has a reach which extends in this forwardly direction such as to extend over the slot formed between the side plates 11 and 13 for a length corresponding to several times the head diameter of the bobbins Q. Also preferably, the pivot axis formed by the shaft 33 is arranged at a suitable height relative to the chute slide surface formed by the surfaces 21, 23 whereby the pivoted arm member 31 has a downward inclination slightly greater than that of the slide surfaces 21, 23 when the lower extending end of the arm member 31 is disposed above the slide members at the height of the heads of the seated bobbins Q.

As a result of the foregoing described portion of the arrangement, the pivoted arm member 31 acts to change the direction of the successive quills Q received from the conveyor 15 and to position them on the feed chute slide members 11, 13, 21, 23, as a part of a changing group of bobbins Q collected beneath and rearwardly of the forward end of the arm 31. This group of bobbins collects beneath the arm 31 due to the slightly greater downward inclination of the arm that disposes it normally to ride directly only the leading bobbin of the group thereunder and thereby to retard the downward delivery of the progressing group of bobbins Q, from which the leading bobbin is released by the feeding pressure of succeeding bobbins fed by the belt conveyor 15. Accordingly, each leading bobbin Q beneath the forward end of the arm member 31 is progressively released generally individually for downward delivery for gravity on the slide or chute 10. While the arm member 31 is normally disposed on the head of the forwardmost bobbin as stated above it will be apparent that in more or less frequent intermittently occurring instances the arm may be pushed upwardly or laterally by grossly high or misplaced bobbins or jams, in which case it will not necessarily be riding the forwardmost bobbin.

An adjustable stop, such as a screw 37, is provided for the arm member 31 adjacent its pivotal mounting, for limiting the downward pivoting of the arm member in relation to the head-height of the bobbins Q, and thereby regulate the retarding exerted by the arm member during its positioning action on the bobbins, so as to control the bobbins effectively while not impeding their downward delivery in the feed chute 10 excessively. Normally, an adjustment of the stop 37 so that the forwardly extending end of the arm 31 may extend downwardly to a position about $\frac{1}{16}$ inch lower than the height of the bobbin heads will dispose the arm member 31 for effective operation, although this position may require adjustment one way or the other under particular operating conditions, and the stop 37 is therefore made readily adjustable.

Because of the previously mentioned rapid feeding rate at which the bobbins Q are delivered by the conveyor 15 to the feed chute 10 and associated pivotally mounted arm 31, it sometimes happens that certain misaligned bobbins that have not been completely aligned or which may be telescoped one within the other and one of which is thereby riding within the other bobbin and quite high, are delivered with the bobbins regularly feeding to the feed chute 10, or that a regularly fed bobbin will jump out of alignment upon reaching the feed chute 10 due to the rapid rate at which it has been delivered. When this happens, the misaligned or misplaced bobbin will cause the rapidly following bobbins to collect and jam unless it is either repositioned or removed promptly.

The pivoted positioning arm member 31 provided according to the present invention is arranged to deal with this situation substantially effectively by being yieldable (against the influence of gravity in the preferred embodiment) for upward pivoting as well as being laterally swingable or movable to permit immediate escape or passage adjacent the upper ends of the feed chute slide member of any bobbins that resist positioning unduly as they enter the feed chute 10. To this end the slot or aperture in the pivoted arm member 31 through which the shaft 33 extends is formed sufficiently oversize as to permit the arm 31 to swing laterally as well as to pivot vertically about the axis formed by the shaft 33. In order to properly center the pivoted arm member 31 above the slot formed between the side plates 11, 13, a pair of compression springs 39 are mounted in resilient biasing relation on the shaft 33 and extend into engagement with the lateral sides of the arm member 31 under slight pressure as through the employment of a pair of collars 43, 45 adjustably fixedly mounted on the shaft 33. It will thus be seen that the spring 39, normally resiliently hold the pivoted arm 31 in alignment with the slot in the chute

10, and that upon lateral movement of the arm member 31 to either side of this aligned position the springs will resiliently urge the member back to its proper aligned position. It will thus be seen that the pivotally mounted arm 31 may not only move vertically on its horizontal pivot axis, but may also readily move against the resilient action of the springs 39 to permit the ready passage or discharge of grossly misaligned bobbins as they proceed from the conveyor 15, this being a very important and highly advantageous feature of this aspect of the invention.

During normal operation a predominant portion of the bobbins Q being delivered by the conveyor 15 will be received and positioned regularly beneath the arm member 31, and any that happen to be so disposed as to resist this positioning, such as inverted bobbins, grossly misaligned bobbins, etc., will simply be allowed to escape above the slide members 11, 13 and fall overboard where they may be collected in some suitable manner (not shown) and returned periodically to the conveyor 15 for rehandling; or if such misplaced bobbins do not escape therefrom through their own action, further apparatus for discharging such bobbins may be suitably provided above the chute 10 in order to assure discharge of such bobbins prior to their entry into the bobbin stripping or cleaning apparatus 19.

One preferred arrangement for removing any abnormally high-riding bobbins Q which have not been discharged prior to their passage beyond the lower end of the arm 37, such as may occur with double-stacked or telescoped bobbins Q₄, or "pieces" Q₅, as shown, for instance, in Figures 3 and 4, there is provided a pair of continuously driven kicker discharge rolls 47, 49 disposed in mutually spaced-apart relation above the normal path of the bobbins Q as they proceed to the guide surface 21, 23 of the chute 10. These kicker discharge rolls 47, 49 may be driven in any suitable manner, as through a pair of flexible drive shafts extending through support arms 51, 53 which may be pivotally supported about a substantially horizontal axis or axes as indicated at 52, 54 on a suitable bracket support 56 operatively connected to the general apparatus framework as may be desired. The pivotal mounting of the arms 51, 53 permits the arms and associated rolls 47, 49 to be moved upwardly away from the chute 10 as may be required. This pivotal mounting 52, 54 does not permit lateral pivoting thereabout of the arms, any slight lateral movement of the arms toward or away from one another when they are in their operative position being preferably only a result of any inherent flexibility which may be present in the arms 51, 53 themselves. The pair of flexible drive shafts extending through the support arms 51, 53 may be connected to a suitable rotary drive source such as an electric motor (not shown) as through the medium of a belt drive indicated generally at 58. The kicker discharge rolls 47, 49 are each preferably conically shaped with their peripheral bobbin-gripping surfaces having a suitably high coefficient of friction which may suitably be obtained as through the employment of a soft rubber or other resilient surface or sub-surface which may desirably have a protective cover of polyvinyl chloride or other plastic or otherwise suitable material. This resilient gripping surface is much preferred due to its relatively gentle handling of the bobbins, quills, or the like; however, in the event that less gentle handling may be tolerated or is not of importance other types of gripping surfaces may be formed on the rolls as by employing sand paper, emery paper, or merely rolls with no surface covering.

The roll axes are preferably inclined to a vertical plane passing through the center of the bobbin holding slot in the chute 10 such that adjacent conical peripheral surfaces 47a and 49a are substantially inclined in somewhat inwardly tapered funnel shape so as to catch therebetween bobbins which are riding above a particular height on the chute 10. The rolls 47, 49 are driven in a direction

with their adjacent lateral surfaces moving upwardly away from the chute 10, and thereby upon contact with the downwardly riding abnormally high bobbins, such as a double-stacked bobbin, these rolls 47, 49 will grasp such high-riding bobbins and throw them upwardly and out of the stream of downwardly flowing bobbins in the quill chute 10. Thereafter, the remaining bobbins will proceed in a normal fashion into the bobbin stripping or cleaning apparatus 19, although there may be a few slightly high-riding bobbins Q which are held in a slightly elevated position between two adjacent bobbins both fore and aft thereof, as by interlocking action between different bobbin rings r, as indicated for example at Q₁, Q₂, Q₃, wherein the slightly high-riding bobbin is indicated at Q₂.

To this end that such slightly high-riding bobbins Q₂ are positioned in direct normally riding engagement on the upper slide surfaces 21, 23, there is also provided a relatively heavy ball 55 of aluminum or other suitable material supported in depending relation adjacent the lower end of the chute 10 as through the medium of a chain 57 in turn mounted on a suitable support 59 disposed thereabove. The heavy ball 55 extends downwardly to a position only slightly above the normal path of the heads of the bobbins Q as they proceed down the slide 10, when such bobbins are in full engagement with the downwardly inclined guide surfaces 21, 23. The ball will, however, contact the heads of any bobbins Q₂ which may be slightly high-riding as occurs when such are supported between two closely adjacent bobbins Q₁, Q₃, as shown in Figure 4. Due to the considerable inertia of the heavy ball 55 the slightly high-riding bobbin Q₂ is retarded slightly, thereby permitting the preceding bobbin Q₁ to proceed slightly ahead of the bobbin Q₂. Thus, the bobbin Q₂ may after further movement down the slide, during which movement the ball 55 is moved forwardly a short distance, then seat directly onto upper guide surface 21, 23 of the chute 10. It will be apparent that while a relatively heavy ball is desirable, the ball should not be so heavy as to cause undue resistance to the passage of bobbins. As an example, a ball having a weight of approximately 1½ pounds and a diameter of approximately 3 inches has been found satisfactory. The provision of the ball in movable depending relation is also advantageous in that this permits slight movement of the ball when a large number of the bobbins Q proceed therepast during this positioning operation on a slightly high-riding bobbin Q₂, such permitting the bobbins to proceed in their normal manner without unduly injuring them or jamming the apparatus.

In order to insure that the hold-down arm will be normally biased toward an exact center aligned position, irrespective of whether the ends of the springs are exactly diametrically even, there are illustrated in Figures 5 and 6 two modifications wherein each of the hold-down arms 131 and 231 is respectively laterally engaged on at least one lateral face thereof by a disc or flange 161 which is secured to or forms one end of a sleeve 163 slidably disposed on shaft 133. As seen in Figure 5 the two flanged sleeves 161, 163 are resiliently biased toward one another through the action of a pair of compression springs 139 each of which surrounds a respective sleeve portion 163 and engages at one end thereof a respective one of the disc flanged portions 161. The opposite ends of the springs 139 are operatively engaged by a respective one of two selectively adjustable collars 143, 145 disposed on the shaft 133. Due to the flat face of each of the disc flanges 161 being biased into engagement with a respective flat lateral face of the arm 131, it will be readily apparent that the arm 131 will be biased in a direction substantially normal to the longitudinal direction of the shaft 133 irrespective of the effective flatness of the end faces of springs 139.

In the modification shown in Figure 6 the biasing arrangement is similar to that of Figure 5 except that one

of the lateral springs 139 and its associated flanged sleeve 161, 163 is omitted and the laterally adjustable collar 243 is positioned with a lateral face thereof laterally adjacent the hold-down arm 231 when the hold-down arm is in its centered position. The hold-down arm 231 is biased toward its center position on the shaft 233 through the action of this oppositely disposed spring 239 and associated slidable flanged sleeve 261, 263, with the outer end of the spring 239 being engaged by the slidably adjustable collar 235. This arrangement may be more advantageous than the arrangement in either Figures 1 or 5 in many instances, in view of the requirement for only one spring 239 and the embodiment of the adjustable collar 243 to provide a positive centering guide for the arm 231.

It will be readily apparent to those skilled in the art that many further modifications and other embodiments may be constructed within the scope and spirit of this invention, the illustrated apparatus being only illustrative and representing the present preferred embodiment of the invention. Accordingly it is to be understood that the invention is not intended to be limited by the foregoing described embodiments but only by the scope of the appended claims.

We claim:

1. Apparatus for handling headed objects such as quills, bobbins, or the like, comprising a chute slide having an inclined upper slide surface, and a three dimensionally horizontally and vertically movable object-hold-down arm disposed above said inclined slide surface and normally extending downwardly toward said slide surface in the same general direction as the direction of inclination of said surface, pivot support means for said arm, said arm being pivotally mounted on said pivot support means above the upper end of said slide for movement both substantially vertically and in a lateral direction transverse to the vertical, said arm being movable in said lateral direction a sufficient amount to permit upstanding stacked quills to be passed thereby along a lateral side thereof.

2. Apparatus according to claim 1 wherein said pivot point is disposed such that the object engaging surface of said arm extends at an acute angle to said upper slide surface when said arm is engaging a normally seated object being conveyed on said slide.

3. Apparatus according to claim 1 wherein said slide comprises a pair of spaced apart substantially vertical extending side plates the upper surface of each of which said side plates is inclined to the horizontal and forms the slide surface for said chute slide, the pivotal mounting point for said arm being disposed above and in advance of the entrance to said slide.

4. Apparatus according to claim 1 further comprising at least one laterally acting spring operatively connected to said arm and acting to resiliently center said arm in substantial alignment with the longitudinal center of said chute slide.

5. Apparatus according to claim 1 comprising a pair of oppositely laterally acting springs operatively connected to said arm and acting to resiliently center said arm in substantial alignment with the longitudinal center of said chute slide.

6. Apparatus according to claim 1 further comprising an open-bottomed friction-surface-conveying belt conveyor having two laterally separate substantially parallel conveyor belts, each of said belts having a substantially unimpeded friction conveying surface, said conveyor having its discharge end disposed at the entrance to said chute slide, whereby over-feeding of said headed objects to said chute slide may be accomplished with intermittent one by one discharge of said objects from beneath the lower end of said arm without resultant harm to either said conveyor or the objects conveyed.

7. Apparatus according to claim 6 wherein said belt conveyor is upwardly extending in the direction of object

flow thereon, said slide being downwardly extending and operative under the force of gravity in conveying objects, whereby an arch is formed by and at the intersection of said belt conveyor and the upper surface of said slide.

8. Apparatus for handling headed objects such as quills, bobbins, or the like, comprising a chute slide having an inclined upper slide surface, and a horizontally and vertically movable object-hold-down arm disposed above said inclined slide surface and extending downwardly toward said slide surface in the same general direction as the direction of inclination of said surface, said arm being pivotally mounted above the upper end of said slide for movement in a substantially vertical plane, a pair of spaced-apart kicker rolls disposed in spaced apart relation above said slide, and means for rotatably driving said kicker rolls, each in an opposite direction with the adjacent peripheral surface of each of said rolls moving in an upward direction away from said slide, said rolls being conically shaped, the adjacent peripheral surfaces of said rolls being inclined to one another to form a funnel shaped entrance for high riding objects to move into engagement therewith and therebetween.

9. Apparatus for handling headed objects such as quills, bobbins, or the like, comprising a chute slide having an inclined upper slide surface, and a horizontally and vertically movable object-hold-down arm disposed above said inclined slide surface and extending downwardly toward said slide surface in the same general direction as the direction of inclination of said surface, said arm being pivotally mounted above the upper end of said slide for movement in a substantially vertical plane, a weighted ball, a flexible connection to said ball, a support disposed above said slide, said ball being dependently supported from said support through said flexible connection and with its lower surface disposed at a point above the normal object flow path along said slide and in subsequent flow relation to said arm.

10. Apparatus according to claim 9, further comprising a pair of kicker rolls disposed in spaced-apart relation above said chute slide and in substantial alignment therewith, and means for continuously rotating said rolls in a direction whereby their adjacent peripheral surfaces move upwardly and away from said chute slide.

11. Apparatus for handling headed objects such as quills, filling bobbins, or the like comprising a slide, a pair of mutually spaced-apart object-kicker-discharge rolls disposed in spaced-apart relation above said slide, and means for rotatably driving said rolls each in an opposite direction with the adjacent peripheral surface of each of said rolls moving in a direction upwardly and away and away from said slide, wherein said rolls and their

adjacent peripheral surfaces are inclined to one another and to the longitudinal center of said slide, said slide surface being inclined to the horizontal.

12. Apparatus according to claim 11 wherein said rolls are conically shaped, a pair of pivotally mounted curved support arms, said rolls being supported adjacent their larger ends each on a respective one of said pair of curved arms, and a flexible drive connection extending through each of said arms to the respective one of said rolls.

13. Apparatus for handling headed objects such as quills, filling bobbins, or the like comprising a slide, a pair of mutually spaced-apart object-kicker-discharge rolls disposed in spaced-apart relation above said slide, and means for rotatably driving said rolls each in an opposite direction with the adjacent peripheral surface of each of said rolls moving in a direction upwardly and away and away from said slide, wherein each of said rolls has a resilient peripheral gripping surface, the adjacent peripheral surfaces of said rolls being inclined to one another.

14. Apparatus for handling headed objects such as quills, filling bobbins or the like comprising an object flow slide having two longitudinally extending spaced apart substantially parallel object supporting and slide surfaces, and a weighted mass having a lower substantially arcuate convex surface disposed above said slide, said mass being spaced above said slide with its lower curved surface at a height above said slide slightly greater than the height of the tops of normally seated objects conveyed on said slide, said mass being supported swingably above said slide.

15. Apparatus according to claim 14 wherein said mass is a substantially spherically shaped ball.

16. Apparatus according to claim 14 further comprising an overhead support disposed above said slide, and a chain operatively connected to said support, said ball being operatively supported in laterally movable depending relation by said chain.

17. Apparatus according to claim 14 wherein said two spaced apart slide surfaces are formed by a pair of spaced apart substantially parallel bar rails.

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