

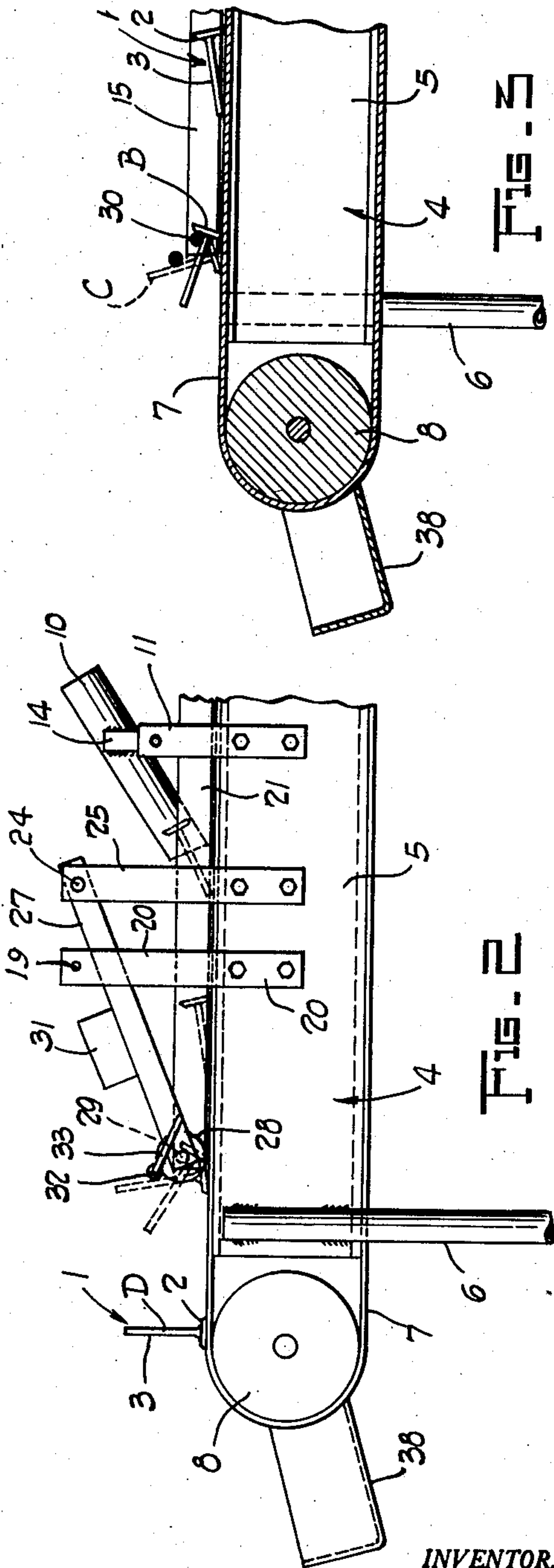
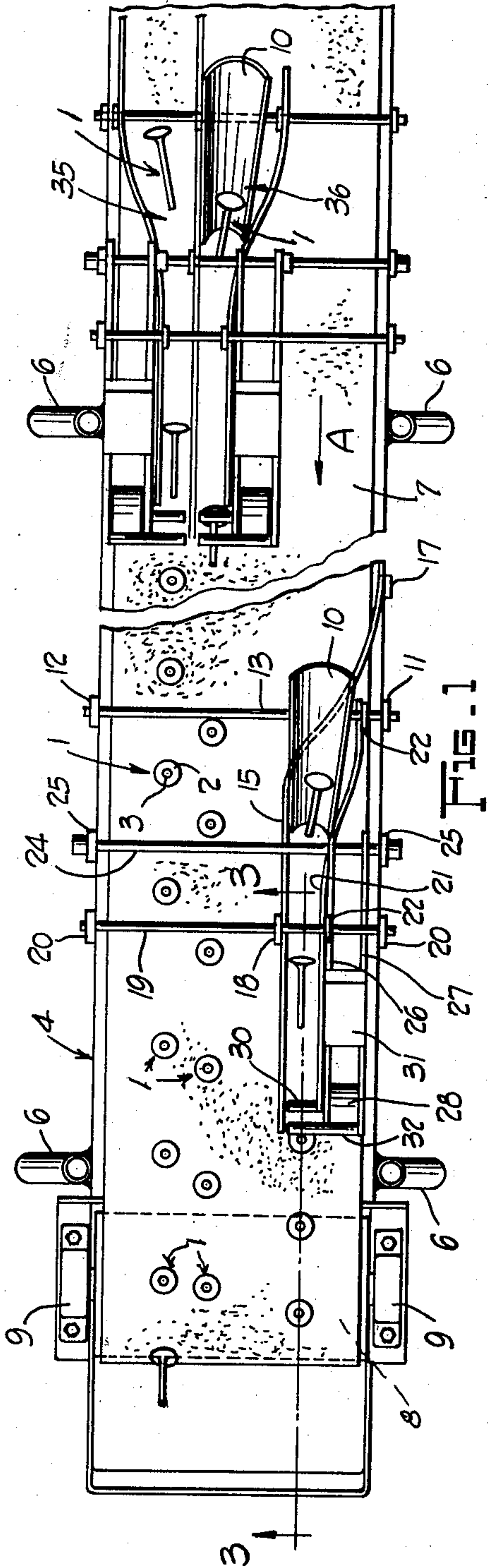
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ARTICLE POSITIONING MECHANISM

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1

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ARTICLE POSITIONING MECHANISM

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4 Claims. (Cl. 198—33)

This invention relates to article positioning mechanism and more particularly to novel means for facilitating the movement of parts for inspection or similar purposes after the manufacture thereof, it being contemplated that a substantial change in position of the parts will be caused to take place to effect the purposes set forth.

Although the mechanism hereof was primarily conceived for the purpose of eliminating manual manipulation of parts, like automotive poppet valves from what may be termed a generally horizontal position to a position whereby the same are erect and supported on the heads thereof, it will be readily understood that the invention is equally useful for handling other types of parts and widely varying shapes as well.

Dealing more particularly with the concept hereof as it relates to parts like the automotive valves mentioned, it should be pointed out that as these parts are machined on automatic, high speed machines, production thereof is very rapid. Further, since each part must receive a visual inspection at least initially to determine whether the seat portion has been completely machined as to one phase of such inspection process, heretofore it was necessary to individually manipulate each part by grasping the same whereafter the said part must be repositioned for observation of the seat portion mentioned. This is obviously such position as will usually result in locating the stem in a vertical position, with the head at the lower end, or would require rotation of the head and stem with the resulting delay in the inspection process.

Since inspection time may be reduced by so positioning the valves that the seat portion is visible from above for example, if that can be accomplished automatically a substantial advance in the art will have been obtained.

Precisely such a result is produced in consequence of the invention hereof which broadly involves the movement of valves or the like in a generally horizontal position, stem end foremost, causing the head of each valve to strike an obstruction, and effecting turning of the stem upwardly, the valve thereafter being caused to move with support being provided by the head.

Having outlined generally the problem dealt with by this invention and suggested the manipulation resorted to, the specific objects will now be set forth.

A primary object of this invention is to provide mechanism that will automatically move parts in rapid sequence, from an initial generally horizontal position, to a substantially vertical position.

A further object of the invention is to provide a machine which will fit into a production line, continuously receive parts in a first position, cause the parts to be turned to a position at nearly a right angle to the first, and enable the parts to be retained in the last position.

Yet another object of the invention is to provide a conveyor unit on to which parts may be deposited, and by positioning an obstruction in the path of movement of the parts, cause the latter to be turned to a pre-

2

determined position, said parts being thereafter carried along in said latter described position.

Another object of the invention is to provide mechanism that includes a movable support onto which parts having a body and a base extending at a substantial angle thereto, may be deposited, the parts thereafter moving along such support to a point where an obstruction is arranged to engage with a portion of each part, another portion being moved farther, such action resulting in turning of each part so as to be moved by the support thereafter in a position at a substantial angle to the first described position.

A still further object of this invention is to provide mechanism, including a conveyor unit having an endless belt to receive one after another, and carry therealong, parts comprising a body and a head for example, an arm extending into the path followed by each part, said arm being located so as to engage each head near an edge, whereby continued movement of the valve in contact with a more remote edge of the head will cause the part to be turned, into a substantially vertical position and thereafter be supported on the head thereof, suitable instrumentalities being provided to control the parts during the turning movement aforesaid.

Other and further object of the invention will be understood from a consideration of the specification appended hereto and shown in the drawing wherein:

Figure 1 is a top plan view, somewhat fragmentary in nature of a mechanism embodying the improvements hereof.

Figure 2 is a fragmentary view in elevation showing one of the sections of the unit.

Figure 3 is a view taken about on the line 3—3 of Figure 1 looking in the direction of the arrows.

As will be understood from a consideration of the drawing, the mechanism hereof is intended to be incorporated in a production line, which production line is arranged to produce automotive poppet valves or the like, such valves being indicated by the numeral 1 and comprising a head section 2 and a stem 3. It will be understood of course that the part which is shown as being used for the exemplification herein, may be of different shape and primarily parts which are susceptible of using this invention to the utmost advantage are of a headed nature or may be generally T-shaped in elevation.

Since the major purpose of the general mechanism shown in the drawing is to position the valves 1 for inspection purposes, the mechanism is shown as being incorporated in a conveyor unit generally designated 4, which conveyor unit includes a body 5 supported at opposite ends or intermediate thereof by the legs such as 6.

The conveyor unit 4 as a whole is provided with an endless belt designated 7 which is supported for movement on large rolls such as that indicated in the left in Figure 2 and designated 8. The rolls or cylinders 8 may be mounted in pillow blocks such as 9 which are in turn connected to the frame 5 in a suitable manner. It will be of course understood that only one of the rolls or cylinders 8 is shown, there being one supplied at the opposite end of the endless belt 7.

It should also be explained that the endless belt 7 is comprised of a material which has a very rough surface preferably and may be of rubber or other suitable resilient composition which although forming no part of the instant invention is most suitable for carrying out the objective hereof.

It is pointed out that the conveyor belt 7 is intended to operate in the direction of the arrow A indicated in Figure 1, or in other words from right to left in all of the figures.

It is also pointed out that although none of the ma-

3

chines from which the valves 1 for example are shown as being received, at the same time it will be clear that such valves 1 may be deposited on to the upper lap of the belt 7 by means of chutes such as 10 supplied.

At this point reference will be made to only one of the positioning units, since it will be readily understood that the others are very similar thereto, in some cases being of either right or left hand construction.

Adverting therefore to the disclosure in Figure 2 in conjunction with that of Figure 1, it will be seen that a chute 10 is arranged so as to be supported above the conveyor unit, engaged with the frame 5 as by means of the uprights 11 at one side and 12 at the other side of the frame 5. The chute is directly connected to the uprights by means of a transversely extending rod 13 from which suitable arms such as 14 extend and engage the chute 10 previously mentioned.

The chute 10 is arranged to deliver valves 1 into a path defined by a guide member 15 at one side, and a further guide member 16 at the other side. The guide member 15 is connected at one portion at the end thereof at 17 to the frame 5 and is bent as shown, extending longitudinally along the upper surface of the belt 7 and being supported at the other end at 18 by a downwardly extending arm, engaging a transversely mounted rod 19 which rod 19 is in turn carried at the upper extremity of the standard 20, one of the latter being at each side of the frame 5, as will be readily understood.

In order to define the path which the valves 1 are to follow, a further guide 21 is provided, being fastened at one end at 22 and carried by a suitable downwardly extending arm engaging the transverse rod 19 previously mentioned.

Extending downwardly and forwardly from a further transverse rod 24, which transverse rod 24 is in turn supported at opposite ends by the uprights 25, suitably fastened to the frame 5, is a pair of guide arms, one being designated 26 and the other 27. The arms are pivotally engaged with the transverse rod 24, previously mentioned, and at their other extremity are provided with a roller 28, which roller 28 is mounted on a rotatable member 29, the roller 28 being designated as a drive member.

The shaft 29 upon which the roller 28 is mounted extends toward the center of the belt 7 and is provided with a portion extending beyond the guide arm 26 upon which is mounted a resilient tubular member 30 for purposes which will be subsequently explained. It will be understood that as the conveyor belt 7 moves in the direction of the arrow A, the roller 28 will move in a clockwise direction as viewed in the Figure 2 disclosure and the resilient member 30 will be similarly rotated therewith.

In order to maintain the roller 28 in driving contact with the service of the belt 7, a suitable weight such as 31 may be provided.

Also mounted at the extremity of one of the arms, namely the arm 27 is a transversely extending control or guide member 32 which member 32 is connected to the arm 27 by means of a rod 33 offstanding therefrom, the member 32 extending transversely as indicated for the purposes as will be shortly set forth.

Before proceeding to a description of the operation of the invention it is pointed out that the mechanism may be duplicated so as to provide for handling of substantial quantities of the valves during the positioning thereof, units such as may be designated generally 35 and 36 being supplied as indicated at the right hand portion of Figure 1, the various elements thereof being substantially duplicative of the various elements previously set forth, although as will be apparent one of these units being the right hand and the other a left hand device.

Adverting now to the description of the operation of the invention, and still referring only for the sake of

4

clarity to the mechanism disclosed at the left hand portion of Figure 1, it will be assumed that automotive valves 1 are being delivered to the chute 10 stem end first, so that a condition such as is illustrated in Figure 2 may be said to exist.

As each valve proceeds from right to left, it will move to the various positions indicated in Figure 2, and proceed to the outer extremities of the arms 26 and 27 whereat the stem will move below the member 30, which is rotating as will be recalled, until such time as the member 30 comes into contact with portion of the head of one of the stems 1 for example being disclosed in the various positions more particularly in Figure 3. The valve designated B in Figure 3 has reached the point where it is in contact with the transversely extending member 30, and since the conveyor belt 7 continues to move toward the left and has the roughened upper surface previously mentioned, a tendency will be to force the valve under the member 30 to the position illustrated by the B disclosure.

Since the member 30 is also rotating in a clockwise direction and is actually resilient, it will tend to assist the rotational or turning movement of the valve 1, until such time as the said valve may be said to reach the position illustrated at C in Figure 3.

At this point the valve in the position at C will contact with the transversely extending member 32, and thereafter be carried along by the conveyor belt so that the said valve will now rest on the head portion thereof as illustrated in the position at D in Figure 2. It will be understood that the transversely extending member 32 is a control member in as much as it prevents the valve from being reversely turned or in any event assists the valve and cooperates with the conveyor belt to maintain the valve substantially upright until it is balanced properly on the head as indicated by the D disclosure in Figure 2.

Thereafter of course the valve in the D position in Figure 2 may move over the end of the conveyor belt into a suitable receptacle such as 38 provided and from that point may be further processed or otherwise disposed of as will readily appear.

It should be emphasized that the transverse member 30 operates as an obstruction and prevents the valves from completely going by the same, and in cooperation with the conveyor belt causes the turning movement of the valve 1 to take place. Further the member 32 also extending transversely cooperates as will be readily understood from the Figure 3 consideration to cause the valve to move into a balanced condition so that it is thereafter resting upon its head in a substantially vertical condition for subsequent movement thereon.

It will also be understood that the units 35 and 36 operate in substantially the same way, to carry out the re-positioning of the valve from the generally horizontal positions which they have been caused to assume at the right hand portion of each of the respective units and to thereafter move into a generally vertical position as compelled by such units.

While there is no drive unit shown for the conveyor belt it will be readily apparent that it can be provided by any suitable mechanism not herein illustrated.

In view of the foregoing it should be emphasized that various types of parts may be caused to be positioned as after the manner illustrated in the drawing herein, and described in relation thereto, wherein the part may be provided with a head which in cooperation with the elements or instrumentalities furnished may be caused to strike an obstruction and be operated on by further movement of the belt so as to turn into the position illustrated and described. It is also pointed out that the roller 28 in rotating and carrying with it the member 30 assists in this turning movement by reason of the resiliency of the member 30 as may be desirable or necessary.

I claim:

1. In article positioning mechanism of the class described, in combination, an endless belt conveyor unit for parts, said unit including a belt, each having a body and a head extending at an angle therefrom, means to deliver such parts to the belt with the bodies supported thereon in a generally horizontal position, and means to move the parts into substantially vertical position comprising means arranged to abut the heads of such parts and by continued movement of the belt cause each part to turn into a position whereby the same is thereafter supported by the head thereof.

2. In article positioning mechanism of the class described, in combination, an endless belt conveyor unit for parts, said unit including a belt, each having a body and a head extending at an angle therefrom, means to deliver such parts to the belt with the bodies supported thereon in a generally horizontal position, means to move the parts into substantially vertical position comprising means arranged to abut the heads of such parts and by continued movement of the belt cause each part to turn into a position whereby the same is thereafter

supported by the head thereof, and instrumentalities to control the positions of such parts after the turning movement aforesaid.

3. The combination as claimed in claim 2, wherein the means to abut the heads include a member extending across the path of movement of such parts, said member being engaged with guide arms connected to the unit.

4. The combination as claimed in claim 3, wherein the member is connected to a drive part for movement thereby, said drive part engaging the conveyor belt of the unit, and the drive part being mounted on the guide arms.

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