April 2, 1946. H. D. LENNON 2,397,610

PART SUPPLYING DEVICE

Filed March 5, 1942

FIG. 1

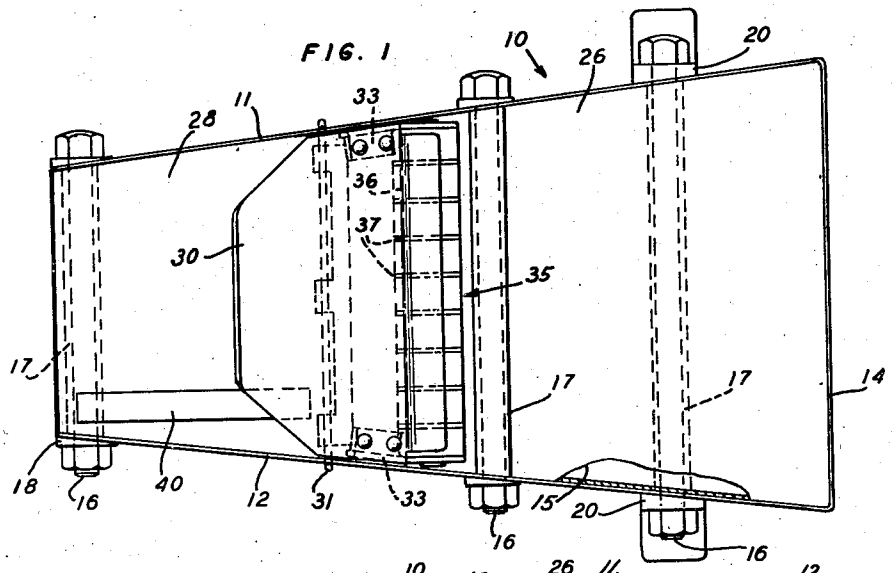


FIG. 2

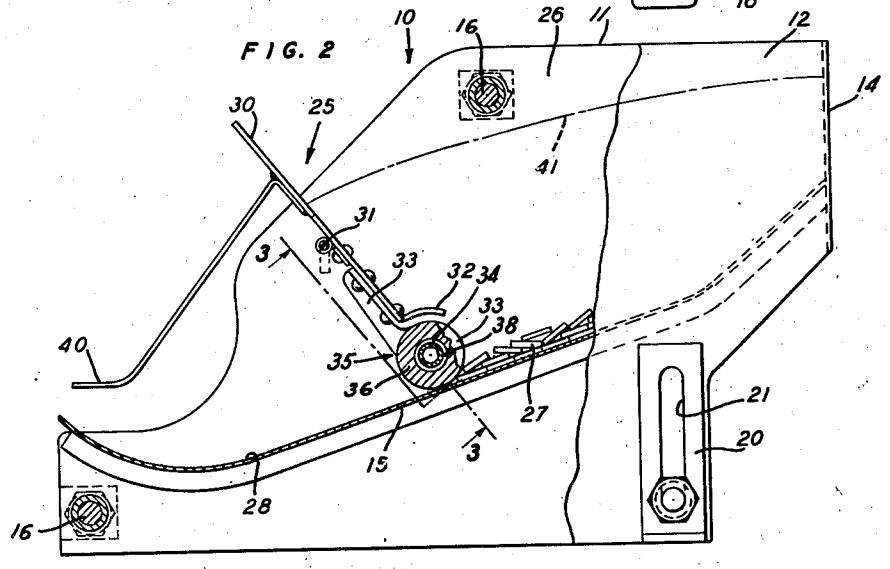


FIG. 3

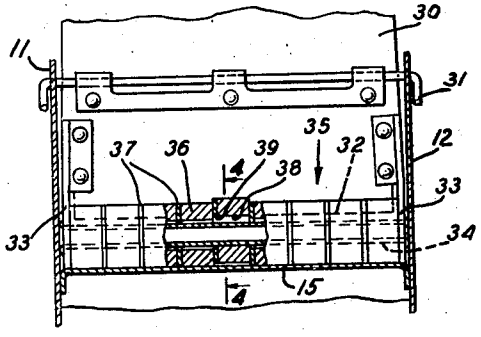
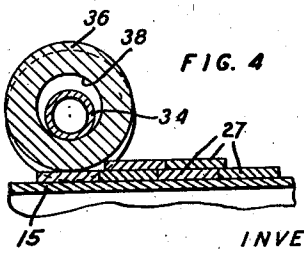


FIG. 4



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PART SUPPLYING DEVICE

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6 Claims. (Cl. 222—9)

This invention relates to part supplying devices, and more particularly to devices for supplying parts for manual assembly.

The element of time is of utmost importance in minimizing the cost of manufacturing articles formed of manually assembled parts. If such parts are to be assembled singly, it is found that the time required to assemble each part in addition to the physical effort on the part of the person assembling the parts, is reduced to a minimum, by supplying the parts singly, to eliminate the necessity of the person separating one part from a group of parts for each assembling step.

An object of the invention is to provide a feeding device which is simple in structure and highly efficient in supplying parts in selected layers.

With this and other objects in view, the invention comprises a feeding device having a body with an inclined bottom portion, the body being divided into a supply reservoir and a feeding tray portion by an actuable element adapted to control movement of the parts from the reservoir onto the tray portion in a single layer.

Other objects and advantages will be apparent from the following detailed description when considered in conjunction with the accompanying drawing, wherein

Fig. 1 is a top plan view of the device;

Fig. 2 is a side elevational view of the device, a portion thereof being shown in section;

Fig. 3 is a fragmentary sectional view taken along the line 3—3 of Fig. 2, and

Fig. 4 is an enlarged fragmentary sectional view taken along the line 4—4 of Fig. 3.

Attention is now directed to the drawing, wherein reference numeral 10 indicates generally a body including side walls 11 and 12, a back wall 14, and a bottom portion 15. The sides 11 and 12 are of the contour illustrated in Fig. 2, and in the present instance are not shown parallel with each other, the purpose of this structure being that a plurality of such devices may be mounted side by side to form an arcuate assembly of devices for feeding various types of parts for the operator's use in assembling an article. A plurality of bolts 16, intermediate sleeves 17 and suitable washers 18 are employed in the present instance as reenforcing means for the sides 11 and 12 and may, if desired, serve as connecting means to connect this device with other similar devices in forming the arcuate assembly aforementioned. Adjustable legs 20, L-shaped in general contour, have elongate apertures 21 in the vertical portions thereof to receive the ends of the adjacent bolt 16, the latter serving to secure the legs in desired adjusted positions to vary the angle of the bottom portion 15. As will be observed by viewing Fig. 2, the sides 11 and 12 extend beneath the bottom portion 15 and it is upon the lower edges of the sides that the entire device rests. The device, however, through the adjustment of the legs 20, may be tilted into various angular positions about the forward lower ends of the sides 11 and 12.

The body 10 is divided into two portions by a control unit, indicated generally at 25, one of the portions of the body being termed a reservoir 26 for a multiplicity of parts 27, the other portion of the body being termed a tray 28, upon which the parts will slide downwardly when released from the reservoir. The control unit 25 has a flat gate-like portion 30 completely separating the two portions of the body and being pivotally mounted on a rod 31, the ends of which are supported in apertures in the sides 11 and 12, or other suitable structures. The lower end of the portion 30 projects into the reservoir, said portion 30 having an arcuate guide portion 32 for a purpose hereinafter described. Brackets 33 are mounted near the lower ends of the portion 30 at the sides thereof, and have apertures therein to receive a hollow shaft 34, the ends of which, in the present instance, are forced outwardly to provide a fixed connection between the shaft and the brackets.

A roller unit, indicated generally at 35, is disposed on the hollow shaft between the brackets and is composed of a plurality of roller sections 36 with intermediate spacing members 37. In the present embodiment the roller sections 36 are formed of suitable material, such as hard rubber, the spacing members 37 being formed of a suitable metal to minimize frictional contact between the roller sections. The roller sections 36 as well as their intermediate spacers 37 have openings 38 and 39, respectively, which are all of the same size but which are larger than the hollow shaft 34, as illustrated in Figs. 3 and 4, for the purpose hereinafter described. To provide means for the manual actuation of the unit 25, a handle 40 is fixed to the member 30 near one side thereof, as illustrated in Fig. 1, and extends forwardly to a convenient point, where it will be readily accessible to the operator.

Upon considering the operation of the device, let it be assumed that the parts 27 are small washers and that the reservoir 26 is filled to the dot-dash line 41 with such parts. The purpose of the arcuate portion 32 is to eliminate the possibility of the parts 27 interfering with the func-

tion of the roller sections 36 and their spacers 37 during the actuation of the unit 25. For the purpose of illustration, let it be assumed that there are no parts on the tray portion 28. To start the feeding of the parts from the reservoir to the tray, the operator actuates the unit 25 through the aid of the handle 40, moving the handle downwardly to cause counterclockwise movement of the unit 25 about its pivot 31, to move the roller unit 35 inwardly through an arc. If desired, the operator may grip the gate 30 to actuate the unit 25. During this movement of the roller unit it is moved away from the bottom portion 15 a sufficient distance to allow a single layer of the parts 27 to pass therebeneath, the same motion of the roller causing rearward movement of other adjacent parts in the reservoir to free the bottom layer of parts to slide, by the force of gravity, down the bottom portion 15 and onto the tray 28. The effect of the force of gravity in carrying out this feeding movement of the single layer of parts on the bottom portion 15 so that they may move onto the tray 28, which in reality is a part of the bottom portion, may be varied, with, of course, variations in the position of the other portions of the body through the adjustment of the legs 20 on their bolt 16.

The operation of the handle may be repeated until the tray portion 28 is filled with a single layer of the parts. When this has been accomplished there is present a sufficient number of parts to carry out several assembling operations and it is not necessary for the operator to actuate the unit 25 each time a part is desired. As a matter of fact it is seldom, through a working day, that an operator needs to actuate the unit 25 through the aid of the handle 40 as the roller unit 25 is adapted to rest on the single layer of parts which extend into the reservoir and may pass freely beneath the sections of the roller unit and onto the tray, as the parts at the forward edge of the tray are removed. It is only when this free feeding of the parts ceases that it is necessary to actuate the unit to cause the roller unit to perform its other functions in loosening the parts in the reservoir and continue the free movement of the single layer of parts. Attention is directed to the contour of the tray 28, which is curved as illustrated in Fig. 2, for several reasons, for example, to eliminate continued travel of the parts when released from the reservoir, the force required to move the parts up to the forward edge eventually balancing the force of the downwardly moving parts, and to position the parts readily accessible to the operator. A further reason for the curvature of the tray portion is to cause parts at the back of the tray to slide forwardly as other parts at the forward edge of the tray are removed. As a result, numerous parts may be located on the tray, some of which may be at an inconvenient portion for the operator to grasp, but as the foremost parts are removed from the tray, the others will slide forwardly, where they may be readily grasped by the operator. A still further feature regarding the tray lies in the thinness thereof, enabling the operator to obtain a part by placing a finger on the top thereof, sliding the part off the forward edge of the tray, where the thumb may engage the under surface of the part as the part is removed from the tray. Furthermore, the entire bottom portion 15 may constitute the tray divided by the unit 25 into a reservoir 26 for parts and a portion 28 to receive the parts from the reservoir in a single layer.

If for any reason two parts 27 should adhere to some other part so that the upper part would not be separated from the lower part during the actuation of the unit 25, the structure of the roller 35 will enable the two connected parts to pass onto the tray without disturbing the remaining sections of the roller. This is made possible due to the large openings 38 and 39 in the sections 36 and the spacers 37 respectively. In such an instance the roller section 36 adjacent the connected parts may be raised upwardly a sufficient distance to allow both parts to pass therebeneath and under the tray without interfering with the control of the other roller sections 36 or the spacers 37. Therefore, if nine parts may be fed simultaneously to the tray and only one of those parts has another part connected therewith, the remaining eight parts will move on the tray in a single layer with the double or two connected parts. As long as the two connected parts remain in the reservoir and are so connected, that they will not be separated through the force of the roller unit, it is to the operator's advantage that such parts be removed and it is of utmost importance that such parts do not disturb the function of the roller unit, regarding the other parts passing onto the tray, during that particular portion of the operation. It will, therefore, be apparent that the device is composed of a body divided into two portions, namely a reservoir for a multiplicity of parts and a tray portion, by an actuable element adapted to control movement of the parts from the reservoir onto the tray in a single layer, allowing, however, foreign parts or inseparable parts to pass onto the tray at any section of the roller unit without affecting the other sections thereof. Furthermore, the function of the roller unit with its sections would make posible the controlling of the movement of various types of parts in a single layer onto the tray, due to the various distances the roller sections may move away from the bottom portion or tray. It is again pointed out that the tray portion has many features for the controlling of the movement of the parts in selected layers to the forward portion, where the parts may be readily grasped by the operator, the contour of the tray controlling additional advancement of the parts as the foremost parts are removed.

Although specific improvements of the invention have been shown and described it will be understood that they are but illustrative and that various modifications may be made therein without departing from the scope and spirit of this invention as defined by the appended claims.

What is claimed is:

1. A part supplying device comprising a body, a partition like element having a roller unit disposed at the lower edge thereof, dividing the body into a reservoir for a supply of parts and a tray portion to receive the parts from the reservoir, means carried by the body to support the element above the roller unit for pivotal movement from a position where the roller unit rests upon the body at the juncture of the reservoir and tray portion to a position in the reservoir, means actuable to cause pivotal movement of the element to move the roller unit into the reservoir, and a guard portion of the element for the roller unit extending into the reservoir partially around the roller unit and movable with the element and unit.

2. A part supplying device comprising a body, and a control unit, dividing the body into a reservoir for a supply of parts and a tray portion to receive the parts from the reservoir, includ-

ing a gate carrying a shaft with its ends fixed to the lower end of the gate and annular members disposed for free rotation on the shaft and having inner diameters larger than the diameter of the shaft for lateral movement of the members relative to the shaft.

3. A part supplying device comprising a hollow body with side walls and a bottom disposed generally at an inclined plane between the walls and fixed thereto, the forward portion of the bottom curving upwardly, an element in the form of a partition, dividing the body into a reservoir for a supply of the parts and a forward tray portion, and means carried by the side walls to pivotally support the element, whereby the lower extremity of the element, will normally rest upon the said bottom to close the reservoir adjacent the tray portion, and will be movable into the reservoir to free parts lying in a single layer across the said bottom for movement toward the said curved portion, the contour of the latter controlling the forward movement of the parts thereon.

4. A part supplying device comprising a hollow body with side walls and a bottom disposed generally at an inclined plane between the walls and fixed thereto, the forward portion of the bottom curving upwardly, an element in the form of a partition, dividing the body into a reservoir for a supply of the parts and a forward tray portion, means carried by the side walls to pivotally support the element, whereby the lower extremity of the element, will normally rest upon the said bottom to close the reservoir adjacent the tray portion, and will be movable into the reservoir to free parts lying in a single layer across the said bottom for movement toward the said curved portion, the contour of the latter controlling the forward movement of the parts thereon, and legs adjustably secured to the side walls to vary the inclined position of the said bottom to vary the distance of movement of the leading parts on the forward curved portion by the force of the following parts travelling down the inclined tray portion of the said bottom.

5. A part supplying device comprising a hollow body with side walls and a bottom disposed generally at an inclined plane between the walls and fixed thereto, the forward portion of the bottom curving upwardly, an element in the form of a partition, dividing the body into a reservoir for a supply of the parts and a forward tray portion, a shaft disposed parallel with the said bottom and having its ends carried by the element adjacent the lower end thereof, annular members disposed upon the shaft for free rotation thereon and having inner diameters larger than the thickness of the shaft to facilitate vertical movement of the members relative to each other, and means carried by the side walls to pivotally support the element, whereby the annular members will normally rest upon the said bottom to close the reservoir adjacent the tray portion, and will be movable into the reservoir to free parts lying in a single layer across the said bottom for movement toward the said curved portion.

6. A part supplying device comprising a hollow body with side walls and a bottom disposed generally at an inclined plane between the walls and fixed thereto, the forward portion of the bottom curving upwardly, an element in the form of a partition, dividing the body into a reservoir for a supply of the parts and a forward tray portion, a shaft disposed parallel with the said bottom and having its ends carried by the element adjacent the lower end thereof, annular members disposed upon the shaft for free rotation thereon and having inner diameters larger than the thickness of the shaft to facilitate vertical movement of the members relative to each other, and means carried by the side walls to pivotally support the element, whereby the annular members will normally rest upon the said bottom to close the reservoir adjacent the tray portion, and will be movable into the reservoir to free parts lying in a single layer across the said bottom for movement toward the said curved portion, the shaft holding the annular members against relative movement when the element is in its normal position.

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