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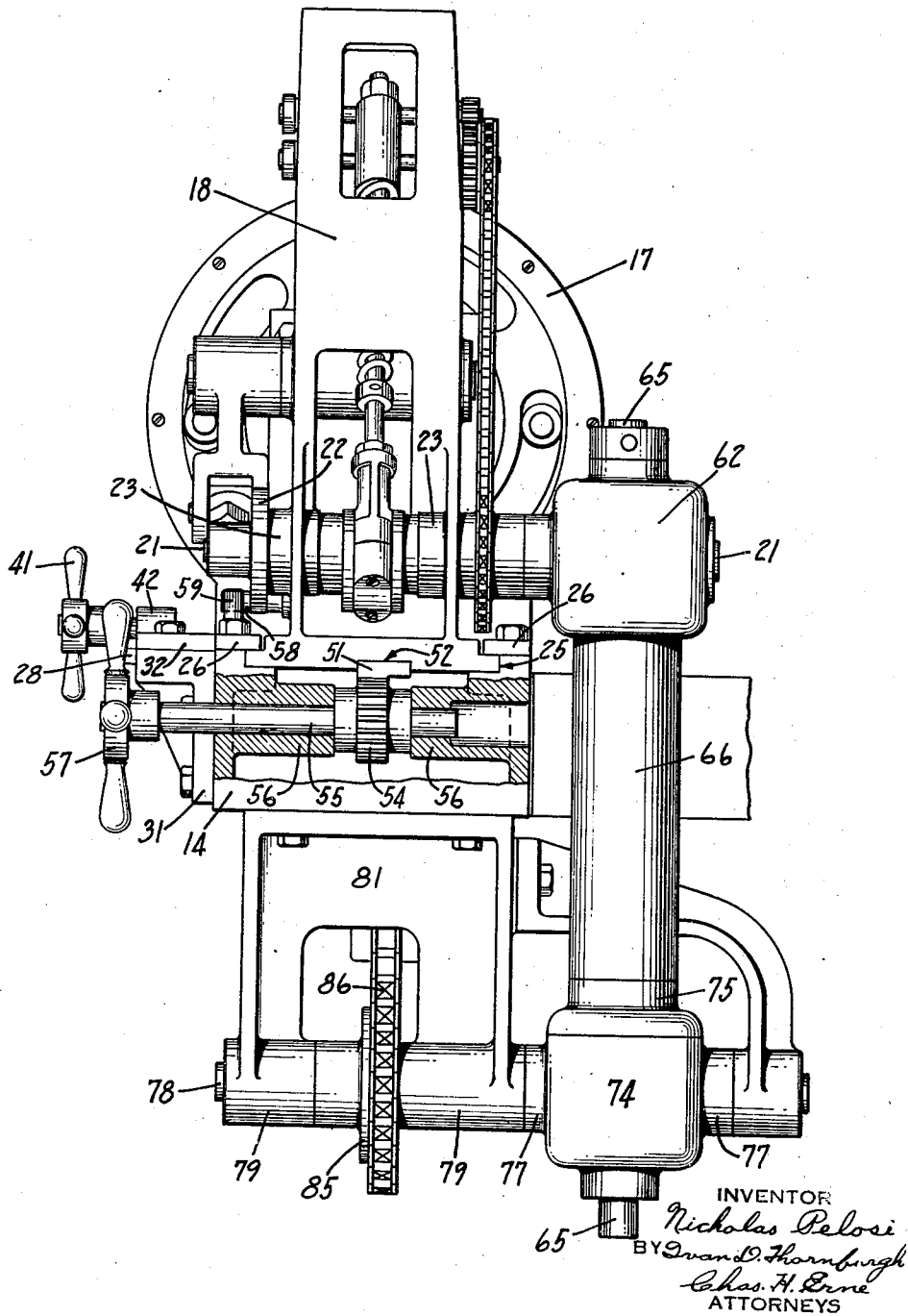
2,268,614

CAN END ASSEMBLING MACHINE

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Fig. 1



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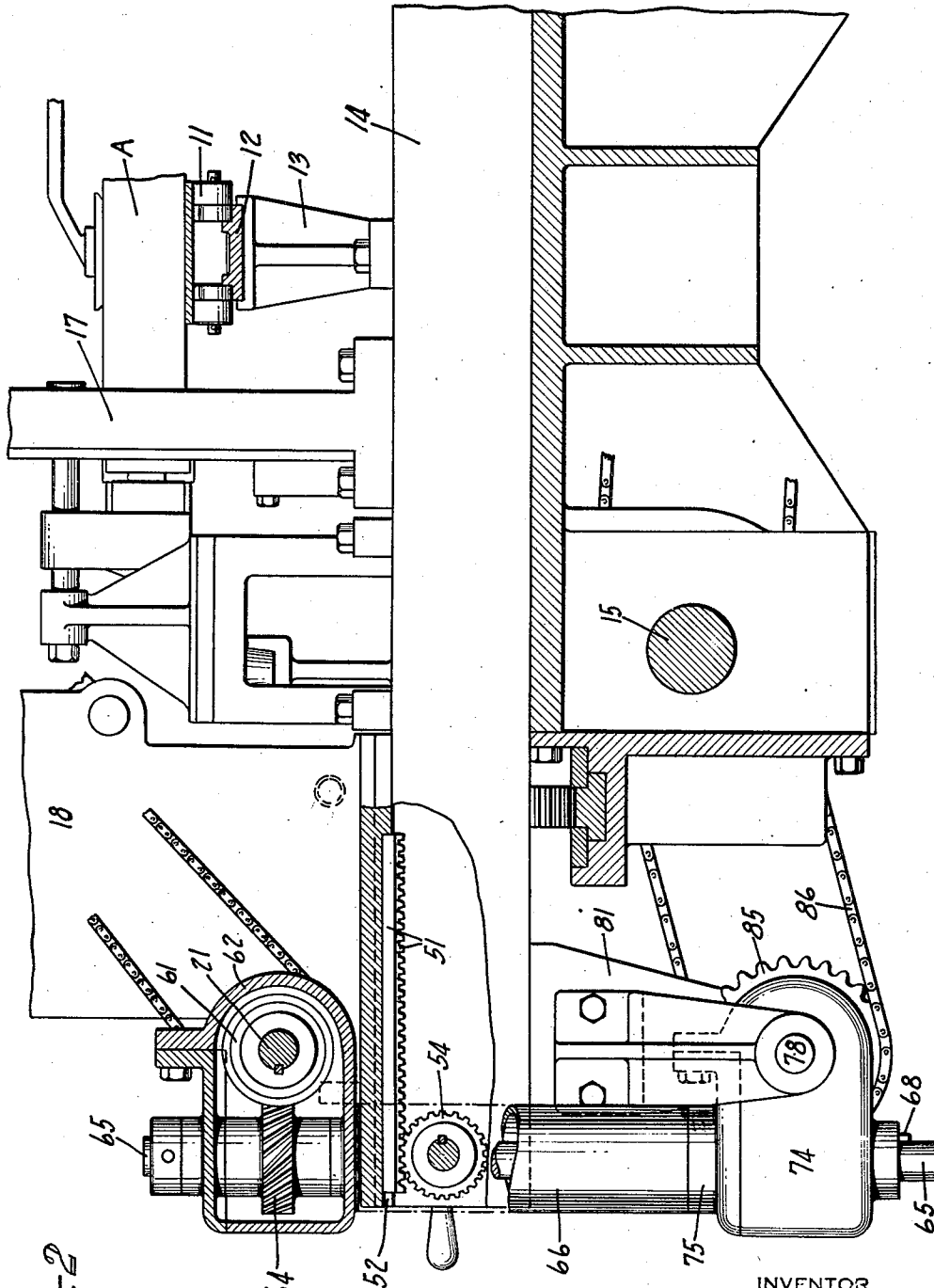


Fig. 2

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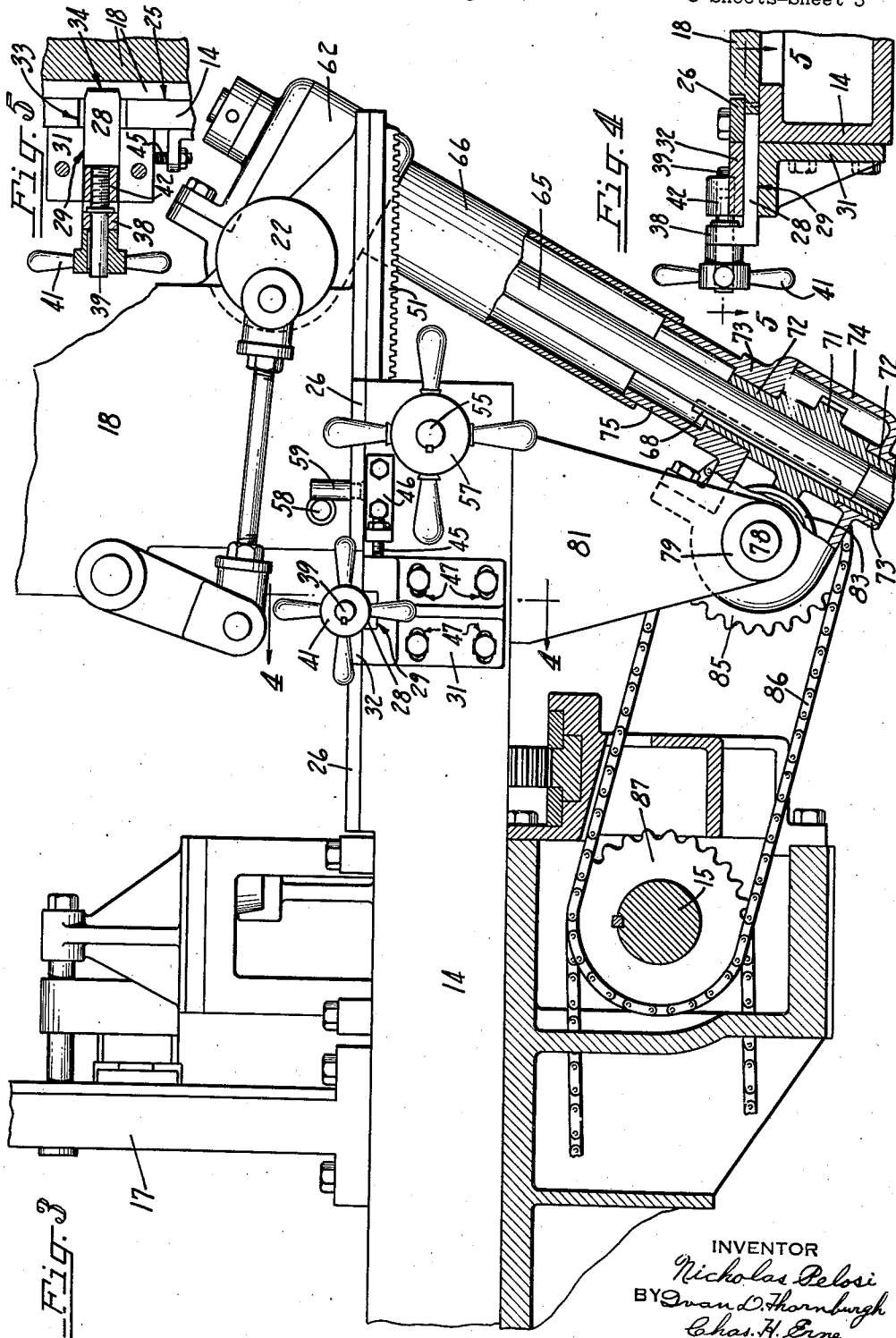
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UNITED STATES PATENT OFFICE

2,268,614

CAN END ASSEMBLING MACHINE

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8 Claims. (Cl. 93—55.1)

The present invention relates to can end assembling machines and the like and has particular reference to devices located at various working stations of the machine which may be quickly shifted out of and back into operating position to clear the machine of jams while maintaining operating connection with the driving shaft of the machine. This is an improvement on the can end assembling machine disclosed in United States Patent 2,200,276, issued May 14, 1940, to J. M. Hothersall et al.

In machines for assembling fibre can ends with fibre can bodies to produce containers made entirely of fibre material, frequent jams occur in the machines due to feeding and advancing such light weight container parts at high speed production rates. A jam of a container part in a machine usually requires stopping the machine to extricate the jammed part and if it occurs in a portion of the machine where the surrounding mechanism is rather intricate often considerable difficulty is experienced in removing the part from the machine.

The instant invention contemplates overcoming this difficulty by providing a quickly movable base structure for intricate container making devices so that the device as a unit may be rapidly shifted free of the jam to clear the machine by quick removal of the jammed container part or parts.

An object therefore of the invention is the provision of a can end assembling machine wherein devices located at working stations in the machine may be quickly shifted out of and back into operating position so that the machine may be cleared of jammed container parts while maintaining operating connection with the driving means of the machine.

Another object is the provision in such a machine of lock elements which lock the working devices in operating position and which may be quickly unlocked to release the devices for shifting them out of operating position.

Numerous other objects and advantages of the invention will be apparent as it is better understood from the following description, which, taken in connection with the accompanying drawings, discloses a preferred embodiment thereof.

Referring to the drawings:

Figure 1 is an end view of devices located at a working station in a can end assembling machine embodying the instant invention, with parts broken away and parts shown in section;

Fig. 2 is a longitudinal sectional view taken through the machine and showing a side of the

devices at the working station in Fig. 1 as viewed from the right in that figure and showing the devices in operating position, with parts broken away;

Fig. 3 is a view similar to Fig. 2 as viewed from the left in Fig. 1 and showing the devices in non-operating position to clear the machine of a jam, with parts broken away;

Fig. 4 is a sectional view taken substantially along the line 4—4 in Fig. 3; and

Fig. 5 is a horizontal sectional view taken substantially along the broken line 5—5 in Fig. 4.

As a preferred embodiment of the instant invention the drawings illustrate the principal parts of the top end member feeding and inserting station of the can end assembling machine disclosed in the above mentioned Hothersall et al. patent. In such a machine fibre top end members are advanced along a curved path of travel to meet a waiting fibre can body and are inserted in place within the body preparatory to being sealed down tight to produce the rectangular fibre milk containers of the character disclosed in United States Patent 2,085,979, issued July 6, 1937, to J. M. Hothersall.

The container bodies indicated by the letter A, are brought into position adjacent the working station by an intermittently movable conveyor 11 (Fig. 2) which operates along a track 12 carried on spaced brackets 13 bolted to the top of a frame 14 which constitutes the machine main frame. The conveyor may be operated in any suitable manner in time with the other moving parts of the machine by connection with a main driving shaft 15. The shaft is journaled in suitable bearings formed in the main frame.

At the working station a container A brought to rest in the conveyor is held in position by a holding head 17. While so held a container end member is fed into position as hereinbefore described by reciprocating feeding devices which are carried in a housing 18 (Figs. 1, 2 and 3). These feeding devices are fully disclosed in the above mentioned Hothersall et al. Patent 2,200,276, and are merely mentioned herein as a background for the instant invention. The feeding devices are actuated from an auxiliary drive shaft 21 and an eccentric 22 carried thereon. This shaft is journaled in bearings 23 formed in the housing 18.

The housing 18 is slidably mounted on top of the machine main frame 14 in a slideway 25 formed therein which is at right angles to the body holding head 17 so that the feeding devices may be shifted toward and away from the holding

head in case a jam occurs in the feeding devices or in the holding head. Gibs 26 bolted to the top of the main frame retain the housing in its slideway.

When the feeding devices in the housing 18 are in operative position in the machine, the housing is disposed adjacent the body holding head 17 as best shown in Fig. 2. The housing is normally maintained in this position by locking instrumentalities which include a flat locking plunger 28 (Figs. 4 and 5).

The locking plunger 28 is carried in a groove 29 formed in a bracket 31 secured to the side of the machine main frame 14. A plate 32 bolted to the top of the bracket holds the plunger in its groove. The inner end of the plunger is tapered and extends through a slot 33 in the main frame and projects into the slideway 25. The tapered end of the plunger fits into locking position within a tapered notch 34 formed in the housing and this locks the housing against movement.

The outer end of the plunger is formed with an upright lug 38 which carries a rotatable stud 39. The stud is locked in the lug and carries on its outer end a hand wheel 41. The inner end of the stud is threadedly engaged in a nut lug 42 on the bracket plate 32.

Hence when the handwheel 41 is rotated in one direction it turns the stud 39 in its nut lug 42 and thereby withdraws the plunger 28 from locking engagement with the housing notch 34 and thus quickly releases the housing 18 so that it may be shifted if desired. By turning the handwheel in the opposite direction the locking plunger may be quickly inserted within the notch 34 to lock the housing in position. The tapered end of the plunger and the tapered sides of the notch insure that the housing is relocated, after being moved, into its exact original position.

Provision is made for adjusting the locking device so that the housing 18 may be located in a predetermined position relative to the holding head 17. This is brought about by manual adjustment of a setscrew 45 which is secured in a small bracket 46 bolted to the side of the main frame 14 adjacent the locking bracket 31. The setscrew engages against an edge of the locking bracket and after loosening the bolts which hold the locking bracket in position it may be shifted by a mere turning of the setscrew. In order to permit this adjustment of the locking bracket its holding bolts extend through slots 47 formed therein.

Shifting of the housing 18 when the locking plunger 28 is withdrawn from locking position is brought about by a rack 51 which is fastened to the bottom of the housing in a longitudinal groove 52. The rack meshes with a gear 54 keyed to a shaft 55 carried in bearings 56 formed in the machine main frame 14. A handwheel 57 is mounted on the outer end of this shaft.

Thus when the housing 18 is unlocked and free to slide in its slideway 25, it may be quickly shifted out of operative position relative to the body holding head 17, as best shown in Fig. 3. This is accomplished by a mere turning of the handle 57 in the proper direction. The feeding device in the housing may thus be moved clear of the holding head so that any jammed container parts in the head or in the feeding device may be readily extricated. By turning the hand wheel 57 in the opposite direction the housing 18

and the feeding device located therein may be quickly returned to operative position.

In order to prevent shifting of the housing 18 too far in an outward direction, i. e., away from the holding head, a stop pin 58 is provided in the side of the housing. This pin engages a similar pin 59 (as shown in Fig. 3) carried in one of the gibs 26 and thus restricts the outward travel of the housing.

During this shifting of the housing 18, the feeding device actuating shaft 21 and eccentric 22 maintain their connection with the main driving shaft 15 of the machine so that no attention need be paid to this part of the machine when attempting to quickly extricate a jammed container part from the machine. The feeding drive shaft 21 carries a helical driving gear 61 (Fig. 2) which is located in a gear casing 62 loosely supported on the shaft (see also Fig. 1). The gear meshes with a helical gear 64 which is also located within the casing and which is keyed to the upper end of a floating shaft 65 (Figs. 1 and 3). This shaft extends down through a depending sleeve 66 formed on the casing.

The lower end of the floating shaft 65 carries a long key 68 which slidably connects the shaft with a helical gear 71 into which the shaft fits. The gear is formed with hollow shouldered trunnions 72 which are rotatable in bearings 73 formed in an auxiliary gear casing 74 but which are restrained from endwise displacement in the bearings by the shoulders on the trunnions. This casing 74 has a sleeve 75 which extends up around the floating shaft 65 and telescopes within the sleeve 66 so that it may slide relative thereto.

The auxiliary gear casing 74 is formed with bearings 77 (Fig. 1) which surround a drive shaft 78 journaled in bearings 79 on a depending bracket 81 bolted to the machine main frame 14. Thus the auxiliary gear casing may swing on the shaft 78.

The helical gear 71 located within the auxiliary gear casing 74 meshes with a similar gear 83 which is also within the casing and which is keyed to the shaft 78. Outside the casing, the shaft 78 carries a sprocket 85 which is continuously rotated by an endless chain 86. The chain operates over this sprocket 85 and over a drive sprocket 87 keyed to the machine main shaft 15.

Hence the rotating main shaft 15, through the sprockets 87, 85, chain 86, shaft 78, helical gears 83, 71, floating shaft 65, and helical gears 64, 61 rotate the feeding device drive shaft 21 and the parts of the feeding device connected therewith. When the housing 18 is shifted away from the body holding head 17 to clear the machine of a jam the floating shaft 65 of the driving apparatus slides in the helical gear 71 while the key 68 maintains the connection between the shaft and the gear. Thus the driving connection between the feeding devices and the main power shaft 15 of the machine is at all times intact and hence no attention need be paid to this drive when a jam occurs in the machine.

It is thought that the invention and many of its attendant advantages will be understood from the foregoing description, and it will be apparent that various changes may be made in the form, construction and arrangement of the parts without departing from the spirit and scope of the invention or sacrificing all of its material advantages, the form hereinbefore described being merely a preferred embodiment thereof.

I claim:

1. In a can end assembling machine, the combination of a frame, a support mounted on said frame for movement thereon into and out of operative position, drive shafts respectively carried by said frame and support, a floating shaft having a driving connection between said drive shafts and mounted for pivotal movement relative to the axis of one of said drive shafts, means for moving said support on said frame into and out of operative position while maintaining said driving connection and during pivotal movement of said floating shaft, and instrumentalities for locking said support in its operative position and for unlocking the same so that it may be shifted to facilitate removal of jammed can parts when such a jam occurs in the machine.

2. In a can end assembling machine, the combination of a frame having main power shaft thereon, a support movably mounted on said frame for carrying work performing devices, said support being movable into and out of operative position, a work shaft carried in said support for actuating said work performing devices, and a floating shaft connecting said work shaft with said power shaft, said floating shaft being bodily movable with said support and pivotally movable relative to one of said first mentioned shafts for maintaining constant connection between said power and work shafts.

3. In a can end assembling machine, the combination of a frame including means for holding a can body, a movable support on said frame cooperating with said holding means to assemble a can end with the held can body, a floating shaft operatively connected at its opposite ends to said holding means and support respectively, and means for shifting said support relative to said body holding means to facilitate removal of can parts which may become jammed in the machine, said shifting movement being accompanied by bodily pivotal movement of said shaft without disturbing its said operative connection.

4. In a can end assembling machine, the combination of a frame including a main drive shaft means for holding a can body, a movable support on said frame having means thereon cooperating with said holding means to assemble a can end with the held can body, instrumentalities for locking said support in a predetermined operative position relative to said body holding means and for unlocking said support when a jam of can parts occurs in the machine, means for shifting the released support relative to said body holding means to facilitate removal of such jammed parts, and a floating shaft connecting said main drive shaft and said can end assembling means and pivotally movable relative to the axis of said main drive shaft during said shifting movement without disturbing its operative connection.

5. In a can end assembling machine, the combination of a main power shaft for actuating said machine, means for holding a can body, a movable support for carrying feeding devices having cooperation with said holding means in assembling a can end with the held can body, means for shifting said support relative to said body

holding means to facilitate removal of can parts which may become jammed in the machine, and a bodily and pivotally movable floating shaft connecting the feeding devices in said support with the main power shaft of said machine irrespective of the position of said support.

6. In a can end assembling machine, the combination of a frame having can body holding means thereon, a support having slidable connection in said frame and movable into and out of operative position relative to said holding means, said support also having a locking notch, a manually operable locking plunger mounted on said frame adjacent said notch and movable into and out of engagement with the notch for locking said support in its operative position and for releasing the support so that it may be shifted away from its operative position to facilitate removal of jammed can parts, means for shifting said support relative to said frame means for shifting said locking plunger along said frame and into an adjusted position to locate said support more accurately when locked in a predetermined position relative to the frame, and a floating shaft having driving connection at opposite ends with said holding means and support respectively, said shaft being pivotally movable relative to said frame during shifting movement of the support without disturbing said driving connection.

7. In a can end assembling machine, the combination of a frame having can body holding means and a drive shaft thereon, a support slidable in said frame into and out of operative position relative to said holding means and having can end inserting means thereon, a rack on said support, a manually operable gear meshing with said rack for sliding said support away from its operative position to facilitate removal of jammed can parts and for returning said support to operative position after the jam is cleared away, stop elements on said support and on said frame for limiting its travel, and a floating shaft having driving connection at opposite ends with said drive shaft and can end inserting means respectively, said shaft being pivotally and slidably movable relative to said drive shaft during sliding movement of said support without disturbing said driving connection.

8. In a can end assembling machine, the combination of a main power shaft, a driving shaft driven from said power shaft, a support for carrying work performing devices which has movement into and out of operative position, a work shaft carried in said support for actuating the work performing devices, a gear on said work shaft, a floating shaft carrying a second gear which meshes with the gear on said work shaft, a third gear keyed to said floating shaft and slidable therealong, and a fourth gear meshing with said third gear and mounted on said driving shaft, said floating shaft sliding in the third gear when the support is moved to maintain the driving connection between the work shaft and the power shaft.

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