Feb. 13, 1934. F. C. SCHUELER 1,946,988

PACK HOLDING MECHANISM

Original Filed June 28, 1930 3 Sheets-Sheet 1

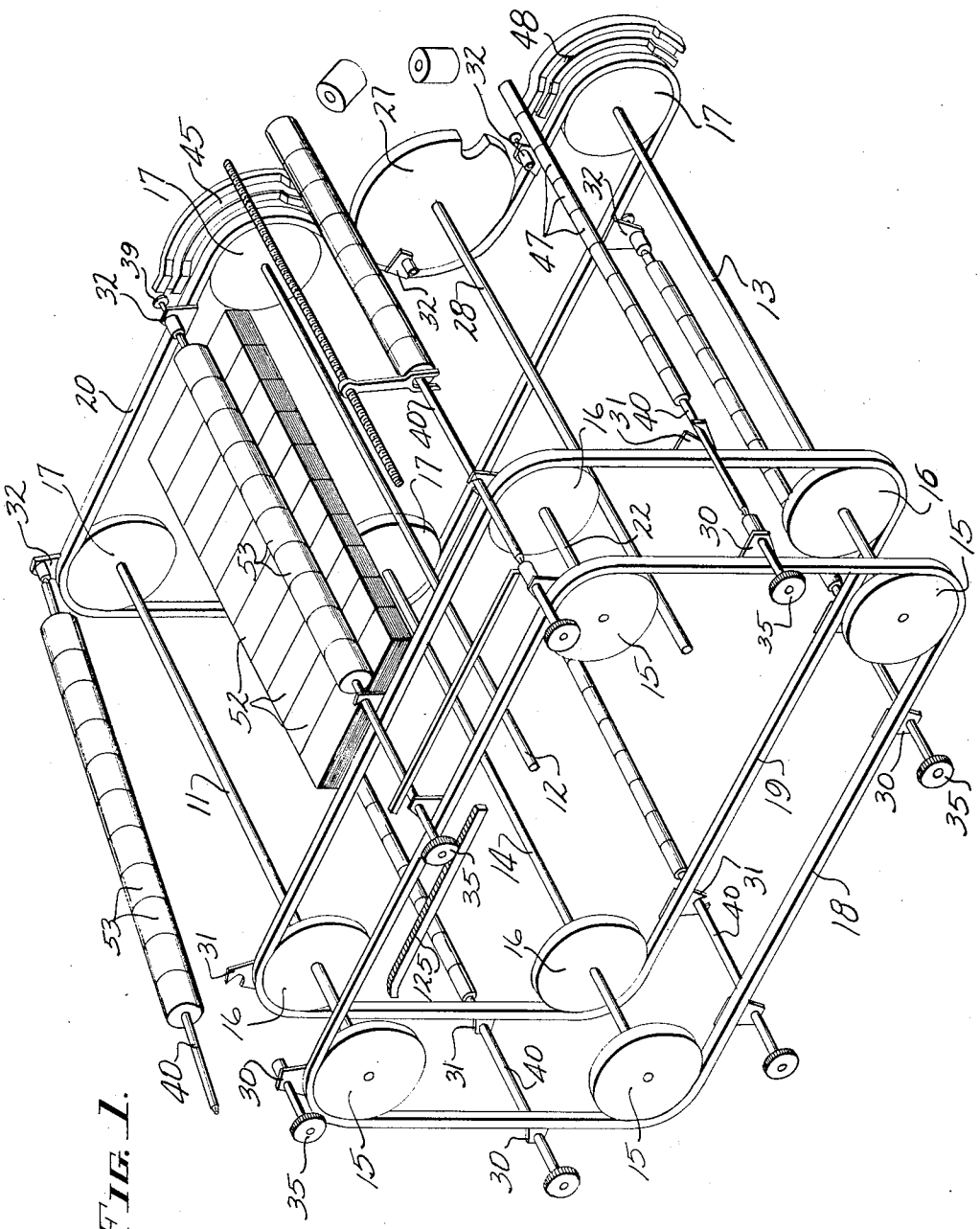

FIG. 1.

INVENTOR
Frederick C. Schueler
BY
Wheeler Wheeler & Wheeler
ATTORNEYS

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FIG. 2.

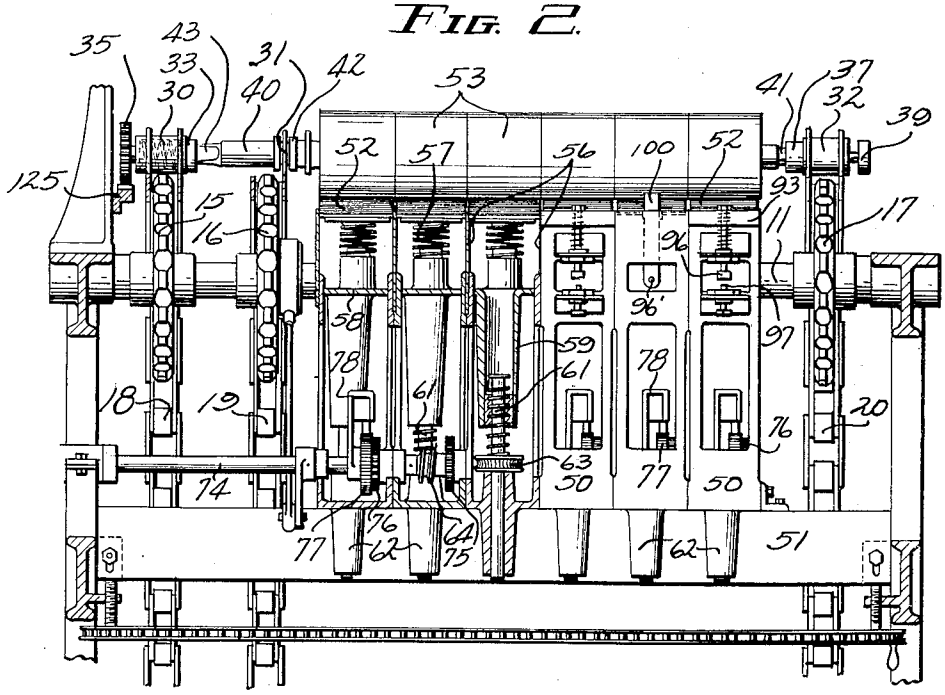

FIG. 5.

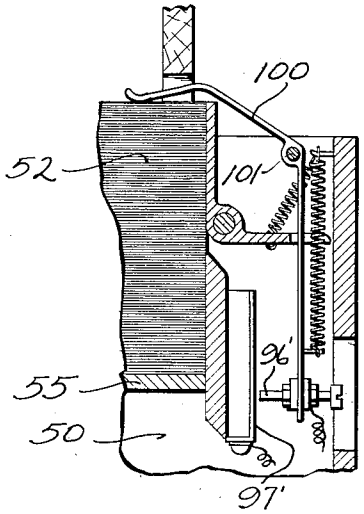

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FIG. 4.

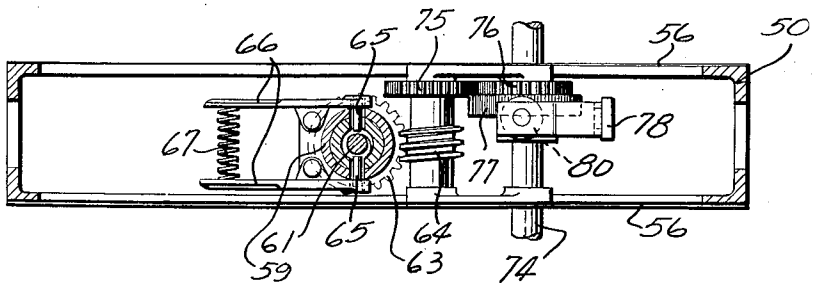
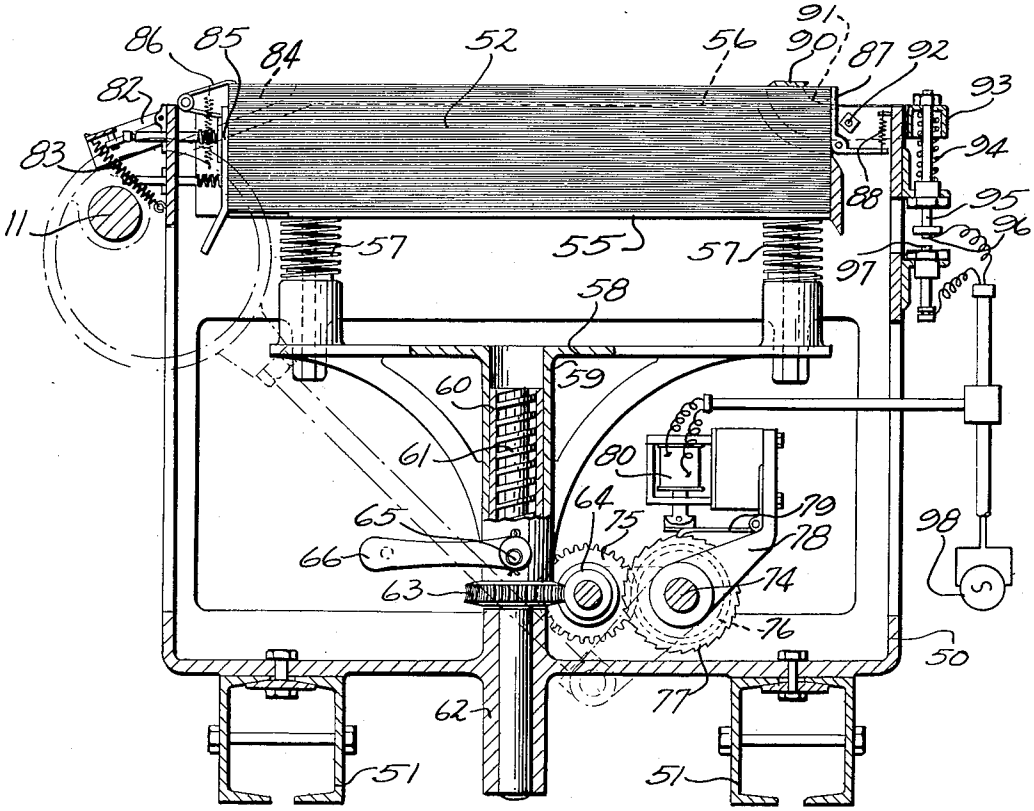


FIG. 3.



INVENTOR
Frederick C. Schueler
BY
Wheeler, Wheeler & Wheeler
ATTORNEYS

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UNITED STATES PATENT OFFICE

1,946,988

PACK HOLDING MECHANISM

Frederick C. Schueler, Green Bay, Wis., assignor to Hudson-Sharp Machine Company, Green Bay, Wis., a corporation of Wisconsin

Original application June 28, 1930, Serial No. 464,482. Divided and this application August 29, 1931. Serial No. 560,149

9 Claims. (Cl. 271—62)

This invention relates to improvements in pack holding mechanism. This is a division of my application for Letters Patent of the United States, Serial No. 464,482, filed June 28th, 1930 and relating to a Labeling machine.

It is an important object of the invention to provide pack holding mechanism in which individual pack holding cells are closely associated with a minimum of intervening clearance.

It is a further important object of the present invention to provide a pack holder in which each pack is mechanically fed to maintain the most advanced article therein constantly in a position for use and subject to substantially constant pressure, the mechanical feeding of the pack holders being automatically controlled.

In the drawings:

Figure 1 is a diagrammatic illustration in perspective of the complete labeling machine including pack holders to which the present invention particularly relates.

Figure 2 is a detail view in transverse section of the apparatus showing some of the pack holding mechanisms in elevation and others broken away to vertical sections exposing their working parts.

Figure 3 is an enlarged detail view in section through a pack holder embodying the invention.

Figure 4 is a bottom plan view of the pack holder shown in Figure 3.

Figure 5 is a fragmentary detail view in longitudinal section through an intermediate label cell.

Like parts are identified by the same reference characters throughout the several views.

Reference to Figure 1 will illustrate one setting in which a pack holder embodying this invention may be used.

Cross shafts 11, 12, 13 and 14 carry sprocket 17 over which conveyor chain 20 operates. Shafts 11, 22, 13 and 14 each carry sprockets 15 and 16 over which conveyor chains 18 and 19 operate. Cross shaft 28 carries a sprocket 27 behind which conveyor chain 20 passes in deviating from a path which otherwise corresponds to the paths followed by conveyor chains 18 and 19.

Conveyor chain 18 carries headstock brackets 30. Conveyor chain 20 carries tail stock brackets 32. The intermediate chain 19 carries open bearing fulcrum brackets 31 for the support of core shaft or mandrel shaft 40 when such shaft is disengaged from its tail stock bracket 32 due to the differing route followed by the tail stock brackets in passing about sprocket 27.

Each core shaft or mandrel 40 is placed in the machine by an operator standing at the left of the machine as viewed in Figure 1. The head stock 30, tail stock 32 and intermediate bracket 31 receive a mandrel carrying full rolls requiring labels. The reduced end portion 41 of the mandrel is first inserted in the tail stock chuck 37. The fulcrum portion 42 of the mandrel is then inserted in the forked fulcrum bracket 31 of the chain 19, chuck 33 being retracted in the meantime by means of pinion 35 which is grasped manually like a hand wheel for the purpose. When the mandrel is in position, the pinion 35 is released and chuck 33, under pressure of its spring, engages the squared end 43 of the mandrel.

As the several chains 18, 19 and 20 operate, they carry with them the mandrels or core shafts mounted in their respective brackets. Between the sprockets mounted on cross shafts 11 and 12 the labeling operation occurs as will hereinafter be more fully described. Immediately after the labeling of the rolls on any given mandrel, the head 39 of its tail stock chuck is engaged by a cam track 45 whereby the chuck is retracted, and the end of the mandrel 40 is left unsupported.

Immediately thereafter sprocket 27 causes chain 20 to take a different course from that taken by chains 18 and 19 and the withdrawal of tail stock bracket 32 on the new course of chain 20 completely exposes the end of the core shaft or mandrel which is now supported entirely by chains 18 and 19.

At this point in the operation of the machine the automatic roll removing mechanism hereinafter to be described commences to operate to push all of the labeled rolls from the mandrel. The movement of the mandrel continues during this stripping operation and after it moves downwardly about shaft 22 a second operator may reload the mandrel with cores 47.

As the tail stock brackets 32 pass about the mutilated sprocket 27 they are received in the relieved portions thereof. The spring mounting of the bearing of shaft 28 takes up the slack occasioned by the straightening of the chain 20 as its brackets 32 enter the cut away portions of the sprocket.

As the chain 20 again approaches a position of alignment with chains 18 and 19 a second cam guide 48, similar to cam guide 45, picks up the headed end 39 of the tail stock chuck and retracts it in order that the end portion 41 of the mandrel 40 may become aligned with the chuck to be re-engaged thereby as the head 39 passes about the sprocket 17 on shaft 13.

From this point a re-cored mandrel proceeds to a position where it may be removed from the machine.

The label cells

The label cell block 50 is mounted on the sub-frame members 51 which extend transversely of the main frame at an intermediate point therein. In the cell block is a stack of labels 52 for each of the fully wound rolls 53 requiring labeling. Guide means are provided for the several stacks of labels and there is also an electrically controlled feeding mechanism for maintaining the labels of each stack in operative relation to the rolls carried by the mandrel 40, regardless of the number of labels remaining in the stack.

Alternate label cells are specifically different from each other, as shown at the right hand side of Figure 2 which is taken in a somewhat different plane from the section in which the left hand side of the view appears.

The stacks of labels 52 are supported on platforms 55 which are vertically reciprocable between very thin partition plates 56. These plates do not extend to the tops of the several stacks, but terminate in spaced relation to the top of each stack, as shown in Figure 2.

The platforms 55 are carried by springs 57 from cross head guides 58 having tubular supports 59. Each tubular support is provided with a bearing sleeve 60 for an elevating screw 61 journaled in a socket 62 in the bottom of the respective cell. The top of each bearing socket 62 supports a worm wheel 63 connected with screw 61 and driven by a worm 64. The pins 65, carried by handles 66, pivoted to the tubular support 59, are pressed by spring 67 through openings in the tubular support 59 and the sleeve 60 into operative engagement with the threads of screw 61 to constitute the equivalent of a nut for releasably receiving motion from the elevating screw 61. When it is desired to refill any given label cell, the handles 66 are manipulated against the compression of the spring 67 to release the pins 65 from screw 61 and thereby to free the cross head 58 and false bottom 55 for downward movement so that a new stack of labels may be placed on the false bottom between the guide partitions 56.

The feed of worm 64, worm wheel 63 and screw 61 is intermittent, being actuated by a rock shaft 74 which passes through the several label cells immediately behind the worms 64.

Directly connected to turn with each worm is a gear 75 meshing with a gear 76 which is free on shaft 74 and is connected to turn with a ratchet wheel 77. Rigidly connected with shaft 74 within each cell is a ratchet arm 78 having a pawl 79 constituting an armature for electromagnet 80. This pawl is arranged to interact with the teeth of ratchet 77 except when the electromagnet is energized and on such occasions it is lifted out of a position for operative engagement with the ratchet. The construction is clearly shown in Figure 3.

It will be noted that the guides 56 not only terminate below the top of each label stack as above noted, but are relieved at their ends, as shown in Figure 3. In order to guide the labels of each stack at the top of the stack I have provided at one end of the stack arms 82 which are pivoted and subject to the tension of springs 83 which tend to hold guide portions 84 of these arms at the level of the top of the stack, subject, however, to yielding movement when the arms are traversed by toilet rolls. The ends of the labels are guided by pressure plate 85 and the uppermost label is barely engaged by a spring clip 86.

At the back of the stack is a guide 87 for the ends of the labels which is fulcrumed like a bell crank, as shown in Figure 3, and subject to the tension of spring 88. Alternate stacks of labels are engaged at the rear end by a yoke-shaped guide 90 which includes a flat plate resting across the top of the stack of labels in spaced relation to the end thereof, and thin sheet metal arms 91 which register with the partitions 56 between the respective cells and hence fit between adjacent stacks of labels. These arms are fulcrumed on bolt 92 and connected with a channel 93 which serves as a seat for a compression spring 94 guided by a tie-rod 95. This rod carries a switch contact 96 coacting with a stationary switch contact 97, the respective contacts being connected in series with a source of current 98 and the electro-magnet 80 above described.

The guides 90 are not used on every cell because such use would involve duplication of the thickness of arms 91 and this would space the stacks of labels to an undesirable degree. It will be understood that the rolls 53 contact at their ends, being re-wound from a single longitudinally slitted web. To the extent to which the stacks of labels are spaced apart the ends of these rolls will be exposed.

The stacks of labels intermediate guides 90 are laterally confined by arms 91 of such guides at each side. In order that each such stack may be governed independently as to feed, a special finger is used as shown at 100 in Figure 5. This finger is fulcrumed at 101 and carries a contact 96′ coacting with a contact 97′, the two contacts being electrically wired to perform the functions of contacts 96 and 97 in Figure 3.

The arrangement is such that during the operation of the machine rock shaft 74 is continuously oscillated to and fro. At each oscillation the pawl 79, carried by ratchet arm 78, will act on the ratchet 77 to operate the gear train which turns each feed screw 61, unless it so happens that the labels of a particular cell have reached the maximum desired level in that cell. In that case the pressure of the labels will act on the guide 90 in the Figure 3 cell construction or upon the guide 100 in the Figure 5 cell construction to close the contact which energizes magnet 80, and thereupon the pawl 79 will be lifted out of operative position and will no longer act to elevate the labels of its cell until enough labels have been used to relieve the pressure on the guide or spring finger and thereby to permit the contacts to open.

Engagement of the roll with the label

As the conveyor chains carry the respective mandrels 40 along the top of the machine, the pinions 35, connected with driving chucks 33 in the head stock brackets 30, will mesh with the stationary rack 125 (see Figures 1, and 2). It is expressly to be noted that the pinions 35 are smaller in diameter than the rolls 53 which require labels. Because of this fact, the rolls 53 are rotated somewhat more rapidly than would be the case if they were merely contacting at their peripheries with a stationary surface.

As each roll clears the clip 86 and rolls onto the adherent end of its respective label, the label will stick to the outer periphery of the roll and hence will free itself from the clip 86. If the

mere rolling contact of the respective rolls with the respective labels were relied upon to wind the labels upon the rolls, the result would by no means be certain since the rolls might not have uniform pressure engagement with their respective labels. In the arrangement disclosed, however, the relatively rapid rotation of the rolls not only positively winds each label upon its roll but also withdraws the remote end of each label from beneath its contact guide comprising, in the Figure 5 construction, the guide 90, and, in the type of cell shown in Figure 7, the contact finger 100. Thus, before the roll reaches the guide, the label has been completely wound upon it and has been sealed at the point of overlap by the pressure engagement of the roll with the stack of labels therebeneath.

I claim:

1. In a pack holder, the combination with a plurality of individual supports for packs of sheets, of an end guide for each pack and lateral guide means in a single plane between each pair of packs, means for mechanically feeding the individual pack supports toward the point of sheet delivery, and means for automatically controlling the operation of said mechanically feeding means, said automatic control means including said lateral guide in one stack of each pair and a separate control finger in the adjacent stack of each pair.

2. In a pack holding device, the combination with a pack support, means for mechanically feeding said support and an automatic control for said feeding means, of a strap embracing the top and side of a pack on said support and connected with said control for the actuation thereof.

3. In a device of the character described, a cell block provided with a plurality of supports for individual stacks of sheets, thin guide means between the respective stacks including yieldable members adjacent the point of sheet delivery from the respective stacks, a yieldable limiting element resting upon a stack and carried by the yieldable members, a mechanical feeding device for the support of said stack, and actuating connections actuated by said members for said device provided with a control operative in accordance with the position of said yieldable limiting element, whereby to maintain a substantially constant pressure on said stack toward the point of delivery.

4. In a device of the character described, the combination with a plurality of adjacent supports for individual stacks of sheets, of thin partition guide means between individual stacks including guide devices spanning alternate stacks, a mechanical stack feeder operatively connected with each support and provided with actuating connections including separate controls for each feeder, means whereby the guide devices spanning alternate stacks are connected to operate the controls for the feeders of the stacks spanned thereby, and separate fingers operatively connected to control the operation of the feeders for the intervening stacks.

5. In a device of the character described, the combination with a plurality of adjacent supports for individual stacks of sheets, of thin partition guide means between individual stacks including guide devices spanning alternate stacks, a mechanical stack feeder operatively connected with each support and provided with actuating connections including separate controls for each feeder, means whereby the guide devices spanning alternate stacks are connected to operate the controls for the feeders of the stacks spanned thereby, and separate fingers operatively connected to control the operation of the feeders for the intervening stacks, and means for simultaneously withdrawing sheets longitudinally from beneath said device and fingers of the several stacks.

6. In a device of the character described, the combination with a plurality of pack receiving cells and individual supports reciprocable therein, of means for actuating said supports, and control mechanism for said actuating means including fingers engageable with the packs on the respective supports, certain of said fingers being interposed between adjacent packs and comprising lateral guides therefor.

7. In a device of the character described, the combination with a plurality of pack receiving cells and individual supports reciprocable therein, of means for actuating said supports, and control mechanism for said actuating means including fingers engageable with the packs on the respective supports, certain of said fingers being interposed between adjacent packs and comprising lateral guides therefor, and alternate fingers being projected across the ends of packs intermediate the guides aforesaid.

8. In a device of the character described, the combination with a plurality of pack receiving cells, and pack supports reciprocable in their respective cells, of mechanical feeding means for the respective supports, control mechanism for each such feeding means, straps passing adjacent the sides and across the top of packs on alternate supports and connected with the control mechanism for the respective packs for the actuation thereof and fingers engaging the packs of intervening cells and connected with the control mechanism therefor.

9. In a pack holding device, the combination with a plurality of individual pack holders each having pack guiding sides serving as the guiding sides of adjacent holders, of means within each holder for feeding a pack therein toward the delivery end thereof, and an automatic control for each of said feeding means, each alternate control including a strap extending across the top of a holder and side portions each disposed in the plane of a side of the holder, said strap being disposed about the end of the holder in spaced relation thereto and the side portions extending above said end, whereby when packs are extending from said holders said side portions will serve to keep the packs in adjacent holders in alignment, and the intermediate controls comprising control levers disposed above the pack holders between said alternate controls.

FREDERICK C. SCHUELER.