Oct. 30, 1962 J. G. SMITH 3,061,304

MAGAZINE FOR HOLDING SHEETS

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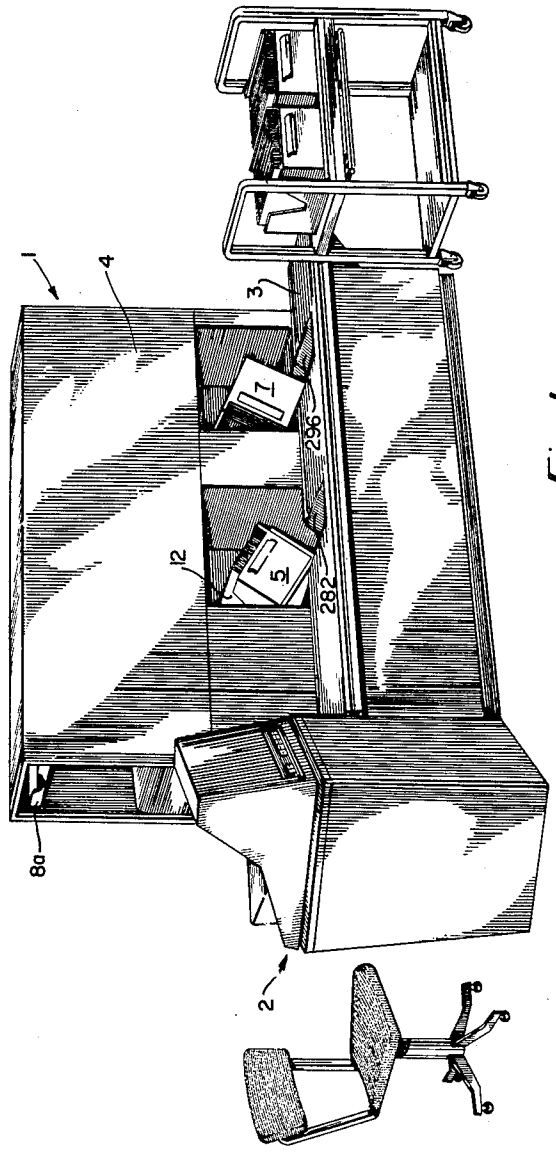


Fig. 1

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Fig. 2

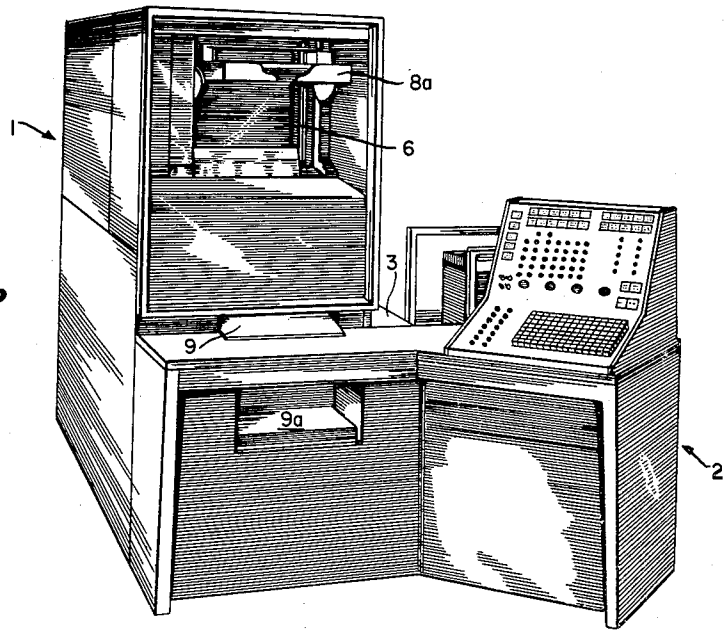
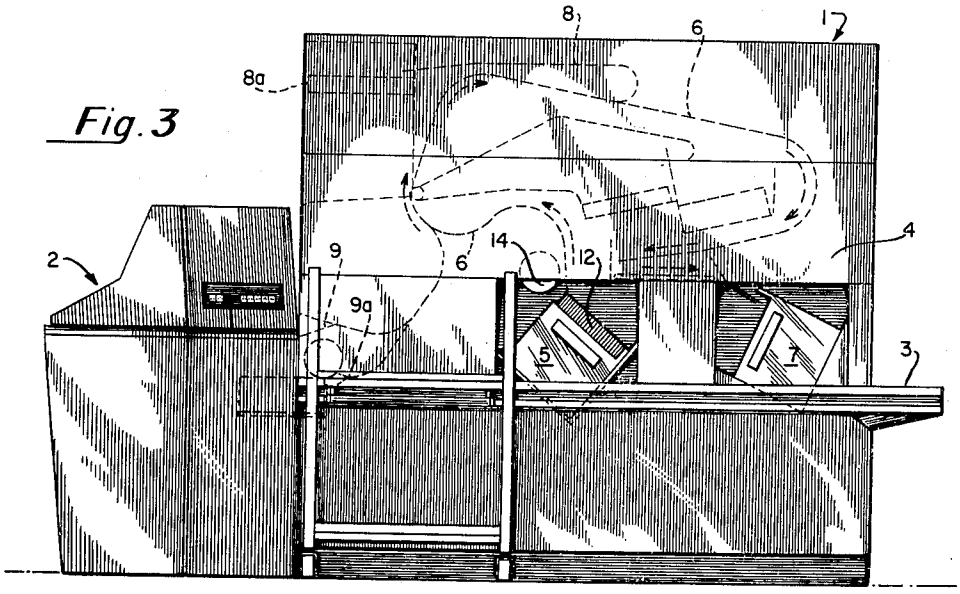


Fig. 3



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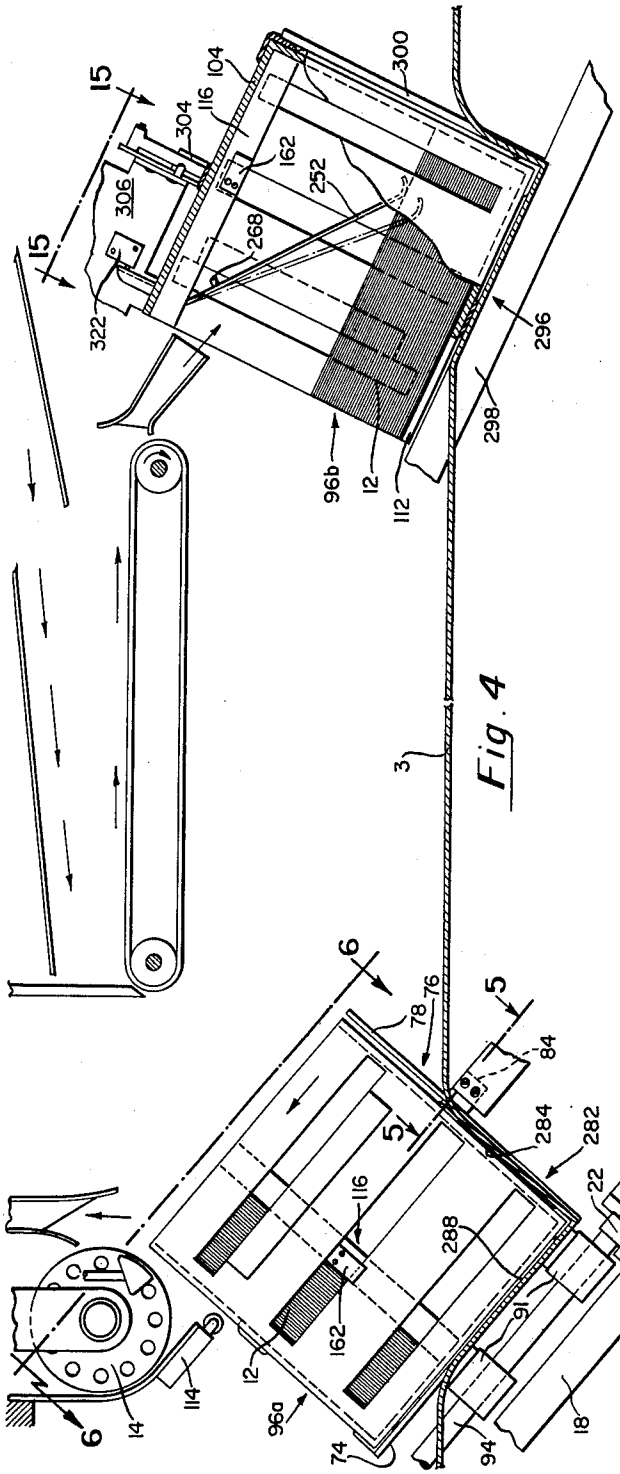


Fig. 4

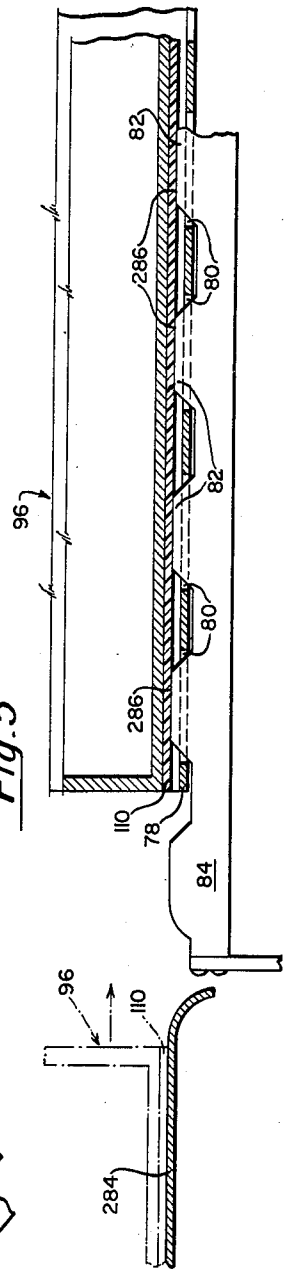


Fig. 5

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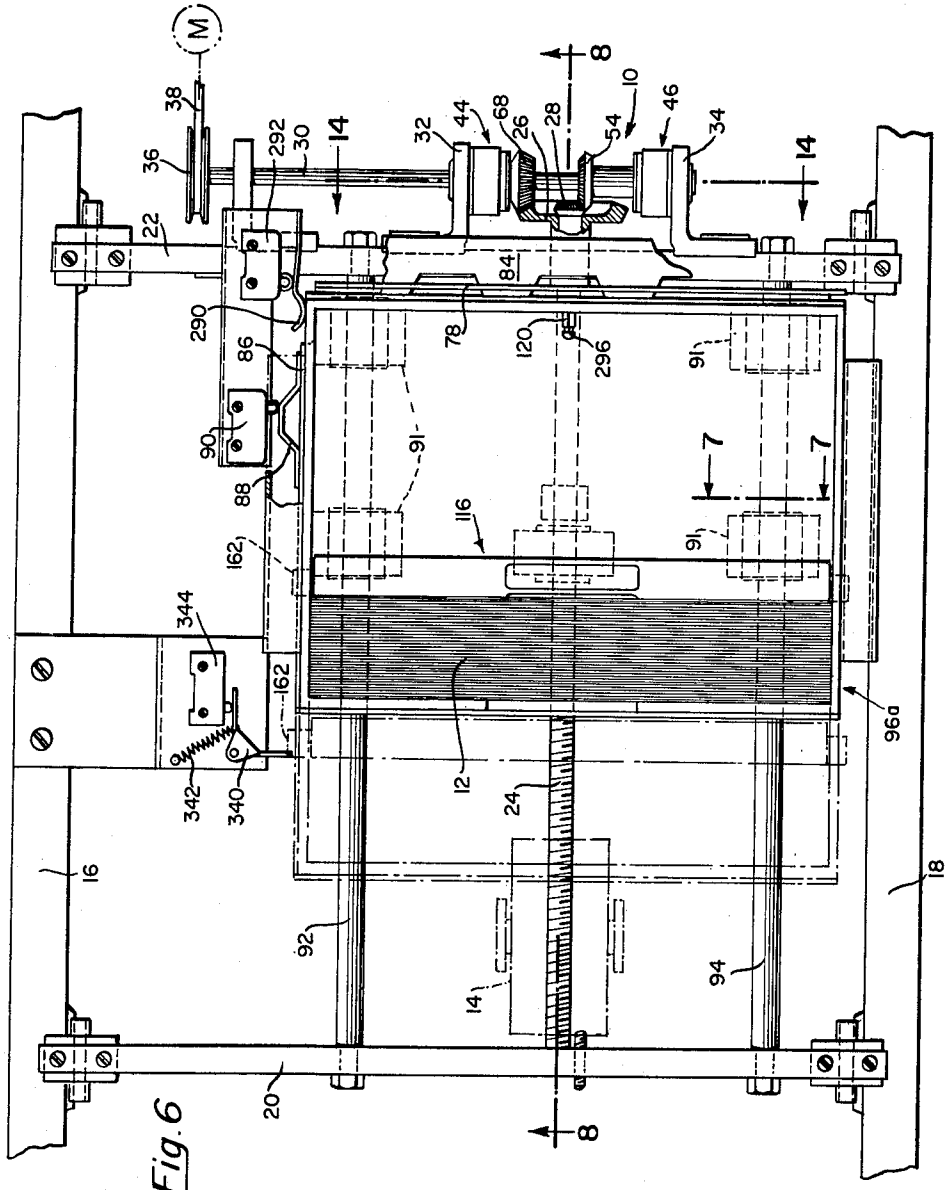


Fig. 6

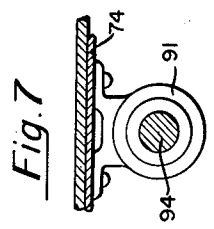


Fig. 7

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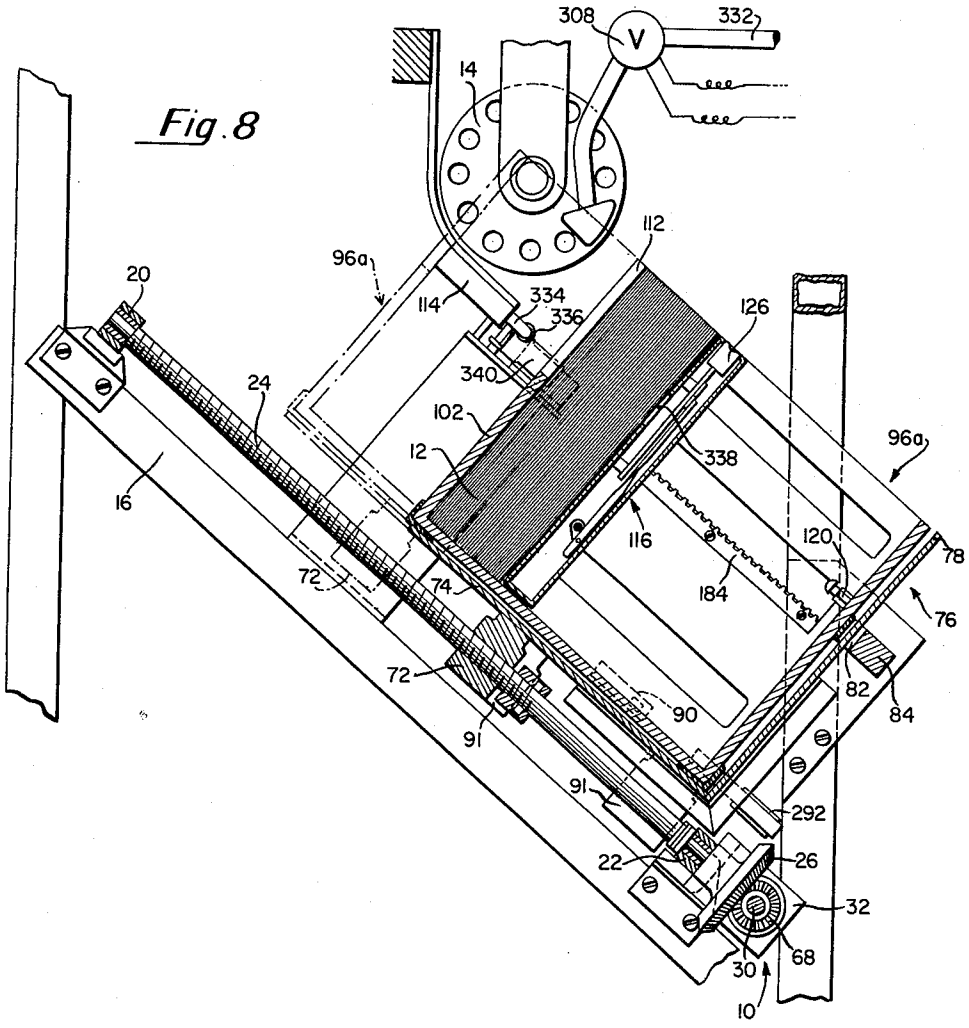
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Fig. 8



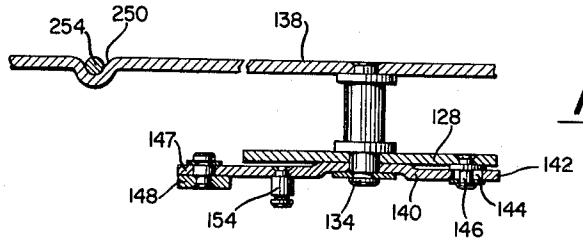


Fig. 9

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Fig. 10

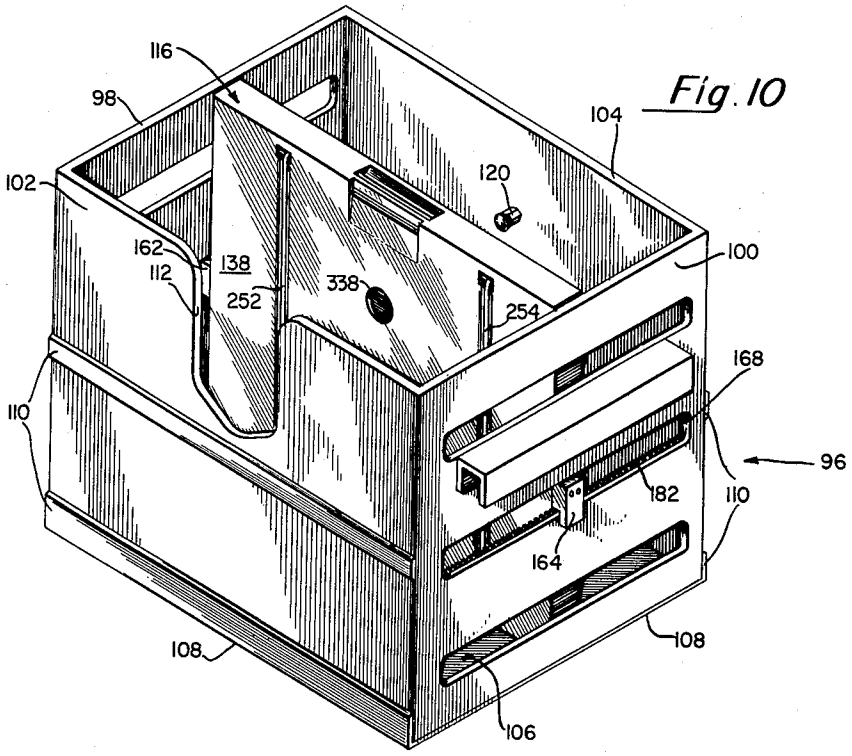
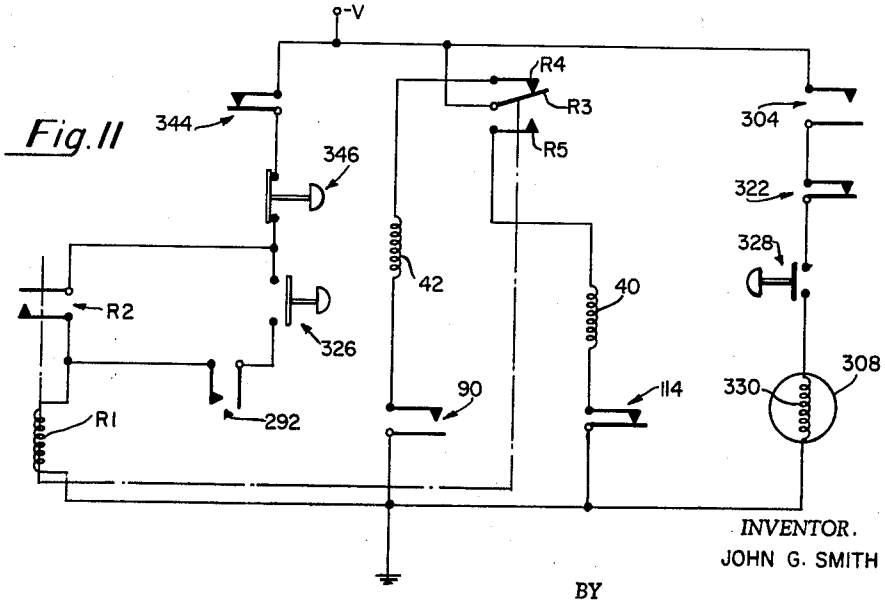


Fig. 11



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Fig. 12

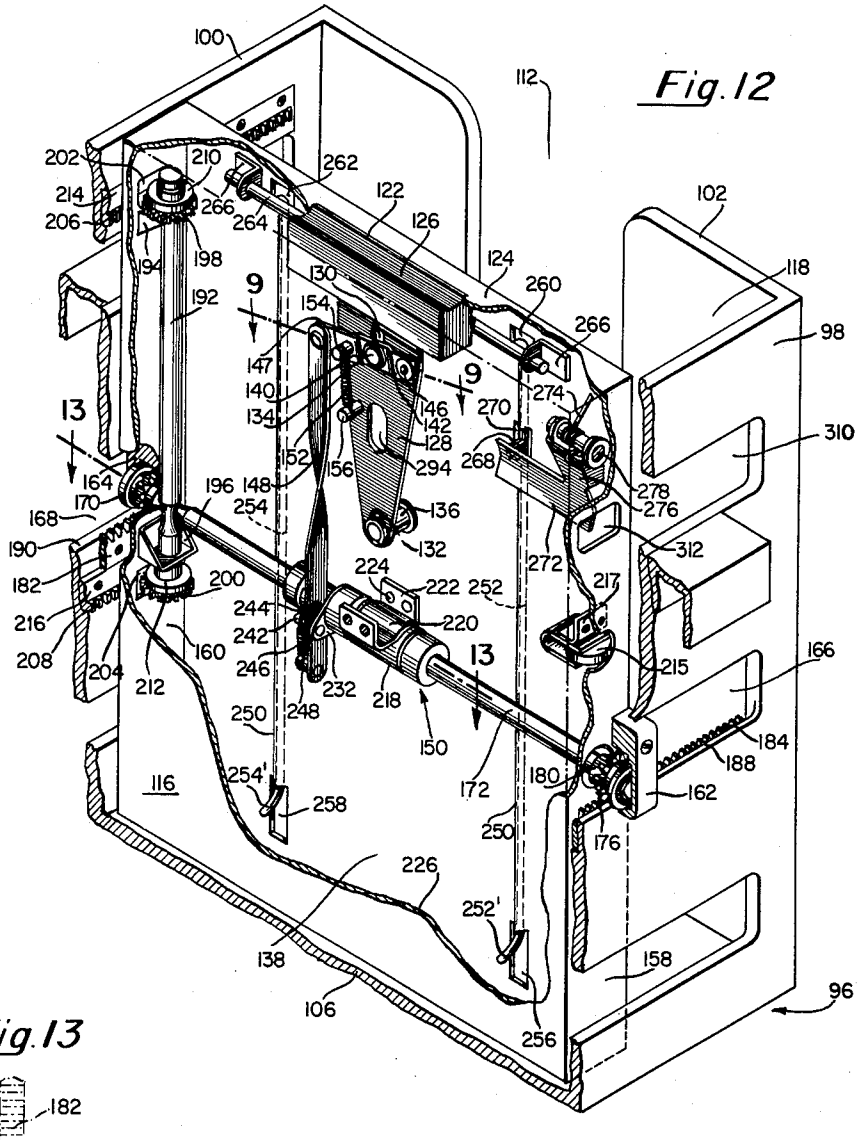
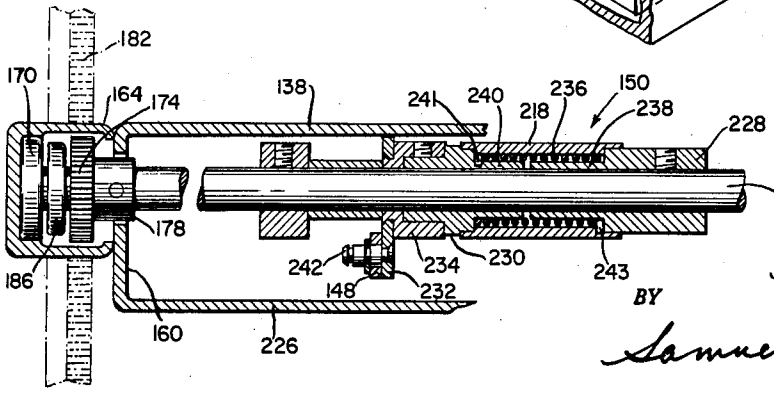


Fig. 13

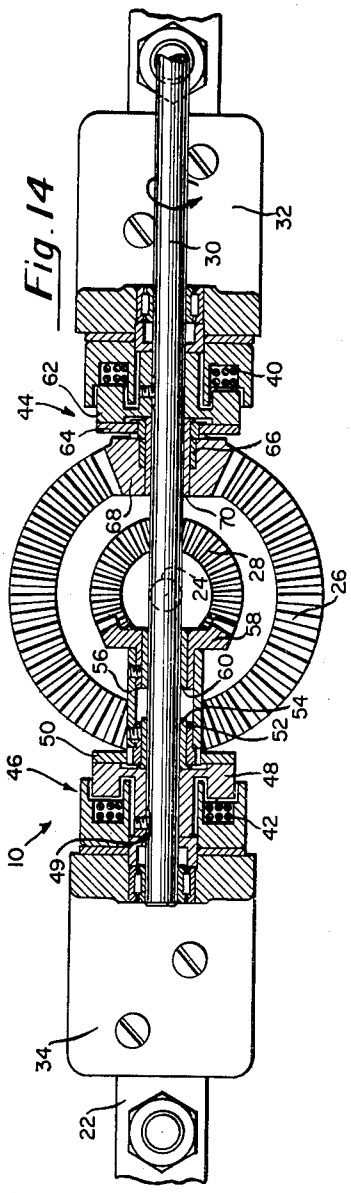


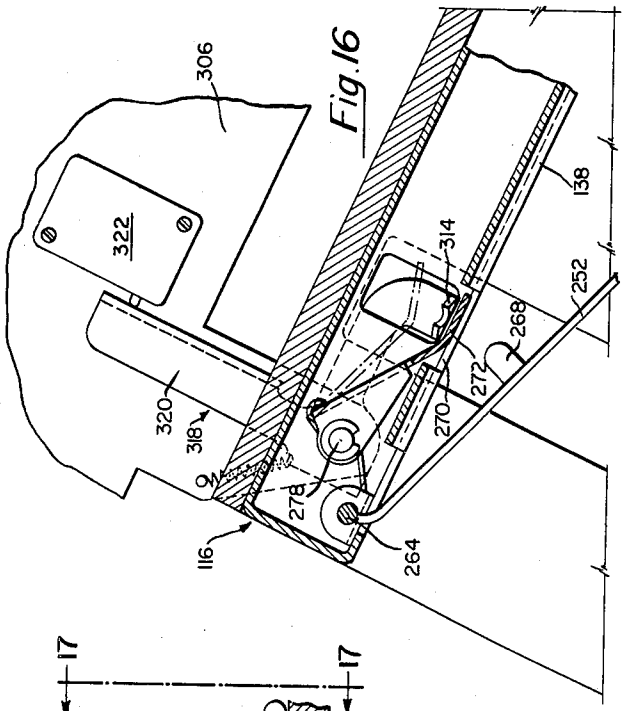
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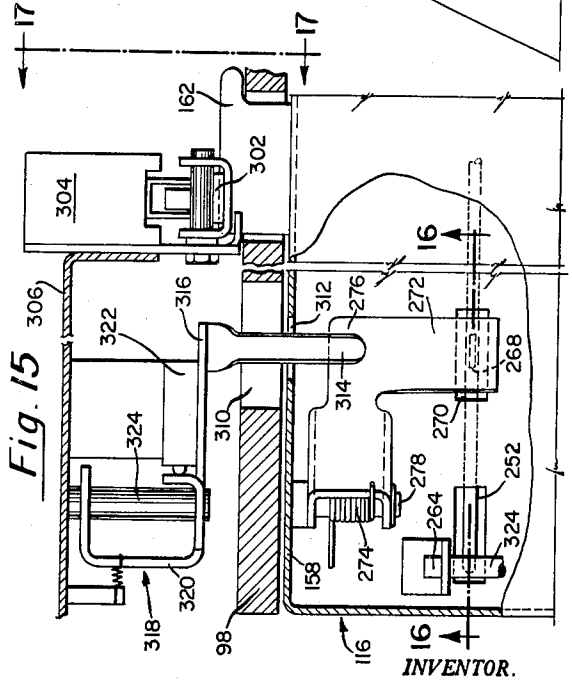
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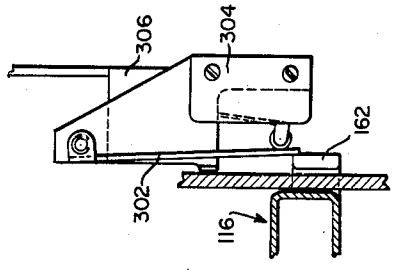
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United States Patent Office

3,061,304

Patented Oct. 30, 1962

3,061,304

MAGAZINE FOR HOLDING SHEETS

John G. Smith, Philadelphia, Pa., assignor to Burroughs Corporation, Detroit, Mich., a corporation of Michigan

Filed Sept. 8, 1959, Ser. No. 838,501
7 Claims. (Cl. 271—62)

This invention relates generally to sheet handling apparatus and more particularly to a novel magazine for containing a stack or pile of sheet items in a sheet feeding machine, or similar apparatus, where the stack is to be advanced to a sheet feeding station at which place the sheets are to be separated individually and successively from the stack. While the invention is useful in a variety of applications in the sheet feeding art, it finds special application in bank bookkeeping machines and the like for containing a stack of forms or documents, such as ledger account record cards or sheets, and therefore it will be described hereinafter in connection with such use.

A primary object of the invention is to provide an improved magazine for containing sheet items to be processed in a sheet feeding machine or other apparatus.

Another object of the invention is to provide such a magazine with means for adjusting the size of its sheet holding compartment for containing sheet stacks of various heights or thicknesses.

A further object of the invention is to provide a sheet holding container or magazine which may be used interchangeably either as a supply magazine or as a stacking magazine.

Still a further object of the invention is to provide such a container or magazine which may be used advantageously for safely storing and preserving valuable record sheet material such as bank records and the like.

Another object of the invention is to provide such a container or magazine having novel means for actuating associated apparatus.

In accordance with the above objects and considered first in its broad aspects, the invention comprises a container or magazine for holding sheet items and an adjustable member in the interior thereof for varying the size of its sheet holding compartment in accordance with the height or thickness of a particular sheet stack. The magazine is particularly adapted for use in a sheet feeding machine either in a supply station or in a receiving or stacking station where it may be used to operate associated apparatus.

The invention will be more fully revealed in the following detailed description of the preferred embodiment thereof when read in conjunction with the accompanying drawings in which:

FIG. 1 is a perspective view looking at the right side of a bank bookkeeping machine utilizing magazines in accordance with the present invention;

FIG. 2 is a front perspective view of the machine of FIG. 1;

FIG. 3 is a right side elevational view of the machine;

FIG. 4 is a fragmentary sectional view illustrating a supply magazine and a stacking machine both similarly constructed in accordance with the invention and positioned in the machine in line with track portions of a loading platform of the machine, the supply magazine being in starting or loading position and supported in an elevating mechanism of the machine;

FIG. 5 is an enlarged sectional view taken along line 5—5 of FIG. 4;

FIG. 6 is a view taken along line 6—6 of FIG. 4;

FIG. 7 is a sectional view taken along line 7—7 of FIG. 6;

FIG. 8 is a sectional view taken along 8—8 of FIG. 6;

FIG. 9 is a sectional view of a fragmentary portion of a magazine partition member taken along line 9—9 of FIG. 12;

FIG. 10 is a perspective view of the magazine which is adapted to be used interchangeably as a supply magazine or as a stacking magazine as shown in FIG. 4;

FIG. 11 is a schematic diagram of a control circuit;

FIG. 12 is another view of the magazine and with parts broken away to more clearly reveal other parts;

FIG. 13 is a sectional view taken along line 13—13 of FIG. 12;

FIG. 14 is a sectional view of a two-speed reversing drive mechanism taken along line 14—14 of FIG. 6;

FIG. 15 is a view taken along line 15—15 of FIG. 4 and showing a portion of the stacking magazine and partially broken away to reveal other parts;

FIG. 16 is a sectional view taken along line 16—16 of FIG. 15; and

FIG. 17 is a sectional view taken along line 17—17 of FIG. 15 and illustrating a switch for conditioning the circuit for operation of a valve for supplying vacuum to a sheet feeding device.

The specific or preferred form of the invention disclosed is specially designed for use in, but not limited to, the bank bookkeeping machine illustrated generally in FIGS. 1, 2 and 3 and described and claimed in a copending application of Robert S. Bradshaw, Serial No. 830,391, filed August 29, 1959, with the title "Sheet Handling Apparatus" and assigned to the assignee of the present invention.

The machine as described in the Bradshaw application and as illustrated in FIGS. 1 to 3 of the present application, comprises an enclosure or cabinet 1 which is rectangularly shaped, a control unit 2 adjacent the front of the cabinet, and a magazine loading platform 3 adjacent the right-hand side wall 4 of the cabinet. The cabinet includes a principal or main sheet supply or loading station 5 from which record items such as ledger sheets are individually and successively fed into a main or primary document feeding path 6 and advanced therethrough to the stacking station 7. As is evident in these figures, the supply and feeding stations are located in the lower portion of the cabinet.

Whenever it is desired to withdraw a ledger from the normal or primary feeding path for the attention of the operator, an auxiliary or secondary delivery path 8, shown at the top of FIG. 3, is coupled with the primary feeding path 6 by suitable switching means (not shown) to deflect the selected sheet into the auxiliary delivery path for feeding therealong into an auxiliary stacking bin 8*a* preferably located at the front end of the machine for easy accessibility.

Occasionally it is necessary to insert a ledger sheet into the primary feeding path 6 from another source and this is provided by a manual insertion slot 9 and an automatic insertion slot 9*a*.

During its movement around primary path 6 certain operations may be performed on the ledger sheets—such as printing and magnetic recording—and these are more specifically described in the above-mentioned Bradshaw application, but they are not important to an understanding of the present invention, and therefore a description of these features has been omitted here.

Before proceeding with a description of the present invention, it should be mentioned that it has also been shown and described in connection with a sheet feeding system embodying an elevating mechanism and associated apparatus described and claimed in a copending application of Robert S. Bradshaw et al., Serial No. 838,324, filed September 4, 1959 and assigned to the assignee of present invention. It is believed that a further description here of the Bradshaw et al. system would be more convenient and beneficial to an understanding of the pres-

ent invention, particularly from an environmental point of view, and therefore a portion of the Bradshaw et al. apparatus will be described first and the balance thereof covered later on in describing the operational association of the present invention with the Bradshaw et al. system.

Now referring more particularly to FIGS. 6, 8 and 14, the Bradshaw et al. apparatus comprises an elevating mechanism for moving a ledger supply magazine or container constructed in accordance with the present invention, at one speed from its loading station to a feeding station where the ledgers are separated one at a time from the stack and into the primary feed path through which they are transported to a stacking magazine, also constructed in accordance with the invention, and for returning the container to its loading position at another speed. To this end, the apparatus includes a two speed reversible drive mechanism **10** for advancing a supply or stack of sheet items such as ledger cards or sheets **12** to a sheet feeding device **14** (FIG. 8) which is adapted to separate the sheets individually and successively from the stack and feed them into the primary path **6**. The sheet feeding device **14** may be of any well known construction but is preferably of the vacuum wheel type of the class shown in the United States Patent No. 939,260.

The elevating mechanism is supported on a stationary framework of the machine including inclined supporting members **16** and **18** (FIGS. 6 and 8) and spaced cross members **20** and **22** secured to members **16** and **18**. An elevating screw **24** is journalled for rotation at its end portions in cross members **20** and **22**, and has secured on its lower end portion coaxial driven bevel gears **26** and **28** (FIG. 14). A drive shaft **30** is journalled in anti-friction bearings in bearing brackets **32** and **34** secured to cross member **22** and has secured on its outer end (FIG. 6) a pulley **36** coupled to a motor M by means of a belt **38**. Secured to the bearing brackets **32** and **34** are solenoids **40** and **42** respectively of electromagnetic clutches **44** and **46**. The electromagnetic clutch **46** includes a magnetizable driving disc **48** secured to the drive shaft **30**, as by set screw **49**, and a driven armature disc **50** slidably keyed on a splined bushing **52**. The bushing **52** is secured to a bearing **54** freely rotatable on the drive shaft **30** and to a sleeve **56** secured to a bevel driving gear **58** and a bearing **60** freely rotatable on the drive shaft. The electromagnetic clutch **44** includes a magnetizable driving disc **62** secured to the drive shaft **30** and a driven armature disc **64** slidably keyed on a splined bushing **66**. The bushing **66** is secured in a bevel driving gear **68** and on a bearing **70** freely rotatable on the drive shaft **30**.

The elevating screw **24** (FIG. 8) is threadedly engaged in a nut **72** secured to the underside of the forward member **75** of a V-shaped or trough-like cradle **76**, whereby the rotative movement of screw **24** is translated into linear movement of the cradle. The rearward member **78** of the cradle **76** is provided with spaced rectangular apertures **80** (FIG. 5) through which extend projections **82** of a fixed stop bar **84** when the cradle **76** is in its lowermost or loading position. The forward member **74** of the cradle **76** is provided at its top edge, as seen in FIG. 6, with an upwardly extending stop flange **86** to which is secured a cam **88** for operating a lower limit switch **90** (see also FIG. 11). Also secured to the underside of the forward member **74** of the cradle **76** are bearing blocks **91** slidably mounted on shafts or ways **92** and **94** secured at their end portions to the cross members **20** and **22** thus to support and guide the cradle **76** during its movement to and from the feeding device **14**.

The above description has preliminary set forth a part of the Bradshaw et al. apparatus in order to establish the preferred environment and utility of the present invention. A detailed description of a magazine constructed in accordance with the invention will now be given. This will be followed by an operational description in which will be set forth the cooperative relation between the present invention and the Bradshaw et al. apparatus.

Now in accordance with the present invention, a container or magazine **96** (FIGS. 10 and 12) for containing the sheets **12** is adapted to be used interchangably either as a supply magazine **96***a*, as shown in FIG. 8, and as shown in the forward or left hand position in FIG. 4, or as a stacking machine **96***b* as shown in the rearward right hand position in the same figure. The magazine is of box-like construction and comprises left and right slotted side walls **98** and **100**, respectively, front and rear end walls **102** and **104** respectively, and a bottom wall **106**. The underside of the bottom wall **106** (FIG. 10) is faced around its marginal portions with strip **108** of a low friction material such as nylon, for example, to facilitate sliding the magazine into and out of the apparatus. The front and rear walls **102** and **104** are fitted with bearing strips **110** of a similar material. The front wall **102** is provided with an indentation or cut-out **112** for freely admitting the vacuum feed wheel **14** and a normally closed sensing switch **114** (FIGS. 8 and 11) to the top of the stack of cards during the course of operation, as will be explained.

The magazine **96** (FIG. 12) is provided in its interior with a movable partition **116** which is manually set to adjust the size of the sheet containing compartment **118** to the particular thickness or height of the stack of sheets **12** when the magazine is used as a supply magazine. When the magazine is used as a stacking magazine, as will be described more fully hereinafter, the partition is latched against the rear wall **104** (FIG. 10) on an anchor post **120** secured to the rear wall.

The partition **116** comprises an outer shell of closed box-like construction preferably formed of sheet metal and having an aperture **122** in its upper horizontal wall **124** for receiving a portion of push-button **126** the major part of which is within the partition. The push-button is secured to a vertical slide **128** which is provided with spaced elongated slots **130** and **132** extending therethrough. The slide is freely received over pins **134** and **136** which extend through the slots **130** and **132** respectively and which are secured to the front wall **138** of the partition **116**. A lever **140** is pivotally mounted at its medial portion on the pin **134** and with one of its ends **142** (FIG. 9) formed with an enlarged slot **144** through which freely extends a pin **146** secured to the slide **128**. At the other end **147** of the lever **140** (FIG. 12) and pivotally connected thereto is a depending link **148** of twisted configuration and associated at its lower portion with a modified one-way spring clutch **150** of well-known construction and which will be described in detail hereinafter.

A tension spring **152** secured to a pin **154** on the lever **140** and to a pin **156** on the slide **128** biases the lever **140** in a counterclockwise direction on the pin **134**, as viewed in FIG. 12, thus urging the slide **128** to its upper position.

Secured to the left and right side walls **158** and **160** respectively of the partition **116** are small housing blocks **162** and **164** freely projecting through the slots **166** and **168** respectively of the side walls **98** and **100** of the magazine **96** and each containing an anti-friction bearing **170** (FIG. 13) for rotatably supporting the end portions of a shaft **172** extending through the right and left side walls **158** and **160** of the partition **116**. Secured on the outer ends of the shaft **172** are spur gears **174** and **176** having hub portions **178** and **180** which extend partially into the interior of the partition **116** through suitable clearance apertures in the side walls **158** and **160**. The gears **174** and **176** are in mesh respectively with racks **182** and **184** secured respectively to the right and left side walls **100** and **98** of the magazine **96**. Rotatably mounted on the end portions of the shaft **172** between the bearings **170** and the spur gears **174** and **176** are rollers **186** which bear

on and are adapted to ride along the lower horizontal edge portions or ways 188 and 190 of the slots 166 and 168. As so arranged, the rollers 186 support the partition 116 at some clearance distance from the bottom wall 106 of the magazine 96 and at the same time maintain the proper pitch circle and pitch line relationship of the spur gears and racks to assure free movement of the spur gears without binding.

The partition 116 is maintained in a vertical position within the magazine 96 by an arrangement of gears and rollers similar to the one just described and which comprises a vertical shaft 192 (FIG. 12), journalled in brackets 194 and 196 secured to the side wall 160 of the partition. Secured on the end portions of the shaft 192 are spur gears 198 and 200 which extend through apertures 202 and 204 respectively in the side walls 160 to mesh respectively with racks 206 and 208 secured to the side wall 100 of the magazine 96. Rotatably mounted on the end portions of the shaft 192 are rollers 210 and 212 likewise extending through the apertures 202 and 204 and bearing on and adapted to ride along vertical flat surface portions or ways 214 and 216 of the racks 206 and 208. The other side wall 158 of the partition carries a roller 215 mounted thereon by a bracket 217. During movement of the partition the roller rides against wall 98 to space that side of the partition away from the wall for frictionless movement of the partition.

The above-mentioned spring clutch 150 is mounted on the shaft 172 (FIGS. 12 and 13) and comprises outer sleeve or barrel 218 secured to a bracket 220 having upwardly extending flanges 222 secured as by screws 224 to the front and rear walls 138 and 226 of the partition 116. Freely received in one end of the barrel 218 is a collar 228 secured on the shaft 172. Also freely received in the opposite end of the barrel 218 is a sleeve 230 of a crank assembly, the latter comprising a crank arm 232 secured to a hub 234 fastened to sleeve 230, the crank assembly being freely mounted on the shaft 172 for rocking motion thereon. A left-hand helical spring 236 disposed within the barrel 218 surrounds shank portions 238 and 240 of the collar 228 and sleeve 230 respectively, with one of its ends 241 anchored in a cross hole in the sleeve 230 and the other end 243 similarly anchored in a cross hole in the barrel 218. Secured to the extended portion of the crank arm 232 is a pin 242 extending freely through an elongated slot 244 (FIG. 12) in the lower end of twisted link 148. One end of a tension spring 246 is connected to the pin 242 and its other end is connected to a pin 248 secured to the lower end of the link 148.

With the mechanism of the partition 116 in the condition shown in FIG. 12, and when viewing along the axis of the shaft 172 from right to left in the figure, the shaft 172 can be turned in a clockwise direction so that the partition 116 can be moved forwardly—toward wall 102—simply by pushing it to the desired position. However, in this condition of the partition mechanism, the shaft 172 cannot be turned in a counterclockwise direction since this motion would tighten the spring 236 and lock the collar 228 and shaft 172 against rotation. Thus when it is desired to retract the partition from a forward position, the push-button 126 is depressed to raise the link 148 and rock the crank assembly whereby the spring 236 is sufficiently unwound to permit the collar 228 and shaft 172 to be freely rotated in either direction. Therefore it will be seen that the partition 116 can be moved forwardly in the magazine 96 simply by pushing it and can be pushed rearwardly therein by holding the push-button 126 depressed.

The outer face of the front wall 138 of the partition is formed with a pair of elongated depressions 250 (FIGS. 9 and 12) for receiving a pair of elongated feeler fingers 252 and 254 having free end portions 252′ and 254′ bent to prevent their ends from scraping the ledger sheets when the magazine is used in the stacking station. So that the fingers will rest flush with the partition wall at other times the bent ends project through apertures 256 and 258 in the front wall 138 and into the interior of the partition 116. The opposite ends of the fingers extend through apertures 260 and 262 in the upper portion of the front wall 138 and are secured to a cross rod 264 journalled in brackets 266 fixed to the inside face of the front wall 138. The feeler finger 252 is provided with a tab 268, as also seen in FIG. 16, adapted to extend through an aperture 270 in the front wall 138 of the partition 116 for rocking a switch actuating arm 272 against the biasing action of a torque spring 274, the arm 272 being part of an L-shaped member 276 pivotally mounted on a pin 278 fixed to the right side wall 158 of the partition 116, as seen in FIG. 12.

Having now described the invention in detail and a part of its operation separate from other apparatus, it will now be described further in conjunction with the operation of the Bradshaw et al. system and its circuitry shown in FIG. 11 to set forth its full operation and utility in the preferred environment of the Bradshaw system.

In describing the operation, the apparatus will first be considered in a normal or non-operating condition in which the cradle 76 is in its lowermost, or loading position, as shown in FIG. 4 and as seen in solid lines in FIG. 8, and with the control circuitry in the condition shown in FIG. 11.

A supply of ledger sheets 12—less than its full capacity—is placed into the magazine 96*a*, before it is placed in the cradle 76 and the partition 116 slid forwardly until the end sheet of the stack is adjacent to and somewhat spaced from the front wall 102 of the magazine. The magazine is then placed on the loading platform 3 (FIGS. 1, 3, and 4) which is provided with a V-shaped track 282 having a surface 284 (FIG. 5) in line with the faces 286 of the projections 82 on the stop bar 84, and having an opposite surface 288 (FIG. 4) in line with the forward member 74 of the cradle 76. It will be recalled that the projections 82 extend through the apertures 80 in the rearward member 78 of the cradle 76 when the cradle is in its lowermost position.

The magazine 96*a* is then tilted into the track 282 and slid therealong into the cradle 76. In this position the magazine is supported by the projections 82 and the forward member 74 of the cradle (FIGS. 5 and 6). When the magazine is pushed into the cradle to the limit of its travel it will come against the stop flange 86 (FIG. 6) of the cradle and rock an arm 290 to close a switch 292 (see also FIG. 11) to partially condition the circuit for operation of the elevating mechanism.

A second magazine 96*b* (FIG. 4) is then prepared for use in the stacking position by depressing its push-button 126 and sliding the partition 116 rearwardly until it abuts the rear wall 104 of the magazine, the rear wall 226 of the partition 116 being provided with an aperture, not shown, for receiving the anchor post 120 (FIGS. 6 and 10) secured to the rear wall 104 of the magazine 96*b*. In this position, the anchor post 120 projects into the interior of the partition 116 and partially extends through an elongated slot 294 (FIG. 12) in the slide 128. The push-button 126 is then released until the lower edge portion of the slot 294 is engaged in a recess 296 (FIG. 6) in the anchor post, thus to lock the partition against the rear wall of the magazine. The magazine is next placed on the loading platform 3 (FIG. 4) and tilted into a V-shaped track 296 with its rear wall 104 and partition 116 in an upward position, and then slid along the track into the machine until it is nested on stationary members 298 and 300 having portions in line with the track 296.

When the magazine reaches its limit of travel it will come against a fixed positioning stop, not shown, and the housing block 162 (FIGS. 15 and 17) on the innermost side of the partition 116 will rock an arm 302 to close a switch 304 (see also FIG. 11) secured to a stationary member 306 of the machine thus to condition the circuit for operating a solenoid-actuated valve 308 (FIG. 8) for supplying vacuum to the feed wheel 14. Also,

upon movement of the magazine 96*b* to the limit of its travel, the slot 310 (FIGS. 12 and 15) in wall 98 of the magazine and an aperture 312 in the side wall 158 of the partition 116 will pass freely over a lateral finger 314 secured to one arm 316 of a spring biased bell-crank lever 318 (see also FIG. 16) whose other arm 320 is in position for operating a full-stack switch 322 (see also FIG. 11) the lever 318 being pivotally mounted on a pin 324 fixed to the stationary member 306 of the machine, and the switch 322 being likewise fixed to the member 306.

In the operation of the system the vacuum wheel 14 and drive shaft 30 are rotating continuously. A push-button switch 326 (FIG. 11) is depressed to energize the coil R1 of a relay thereby to close the holding contacts R2 of the relay and move its transfer contact R3 from the normally closed contact R4 to the normally open contact R5 to energize the solenoid 40 (FIG. 14). Energization of the solenoid 40 causes the driving disc 62 to be magnetized and to magnetically attract and rotate the armature disc 64 thereby to impart rotation to the gears 68 and 26 and thus turn the elevating screw 24 (FIG. 8) to move the cradle 76 and magazine 96*a* angularly upwardly to the vacum feed wheel 14.

As the cradle moves upwardly, the cam 88, which in the lowermost position holds open the lower limit switch 90, by-passes the switch and allows it to close. However, closing of switch 90 at this time has no effect on solenoid 42, as switch contacts R3 and R4 are open. When the top of the stack of sheets 12 reaches the feeding position it will open the normally closed sensing switch 114 (FIGS. 8 and 11) thus to de-energize the solenoid 40 and stop the upward movement of both the cradle 76 and magazine 96*a*. A sheet feed control switch 328 (FIG. 11) is then closed manually to energize the solenoid 330 of the valve 308, thus to operate the valve for supplying vacuum from a suitable source, not shown, to the wheel 14 through a hose 332 and for effecting feeding of sheets 12 individually and successively from the top of the stack.

When one or more of a predetermined number of sheets 12 have been separated from the stack by the feed wheel 14, the actuating arm 334 of the sensing switch 114 will be lowered accordingly to allow the switch 114 to close and again cause energization of the solenoid 40 for advancing the stack of sheets until the switch 114 again opens. This process will be repeated automatically until all of the sheets have been fed out of the magazine 96*a*. As the last or bottom sheet of the stack is fed out of the magazine, the actuating roller 336 of the sensing switch 114 will move into a clearance aperture 338 (FIG. 10) in the front wall 138 of the partition 116 and the housing block 162 will rock bell-crank lever 340 (FIG. 6) against the biasing action of a spring 342 to open an upper limit switch 344 (see also FIG. 11). Opening of switch 344 serves to de-energize the relay coil R1 to open the relay holding contacts R2 and return the transfer contact R3 to the contact R4, thereby de-energizing solenoid 40 and simultaneously energizing solenoid 42, switch 90 being closed. Energization of solenoid 42 will cause the driving disc 48 to magnetically attract and rotate the armature disc 50 thereby imparting rotation to gears 58 and 28 thus to rotate the elevating screw 24 for rapidly moving the cradle 76 and magazine 96*a* downwardly to the starting or loading position. It will be apparent from the gearing in FIG. 14 that the cradle and magazine will be moved downwardly at a faster rate than they are moved upwardly.

If during the sheet feeding operation it is desired to return the cradle 76 and magazine 96*a* prematurely to the starting position, a push-button switch 346 (FIG. 11) is depressed to affect the circuitry and operation in a manner similar to the opening of the upper limit switch 344.

Returning to FIG. 6, it is seen that the housing block 162 moves in a path intercepting arm 340 of upper limit switch 344 and when the last sheet is fed from the magazine the block acts to open the switch. Thus it is seen that since the block is carried by the movable partition 116, the length of upward travel of the cradle 76 in any given feeding operation will be governed by the height or thickness of the stack of sheets 12. In order words, stacks of various heights or thicknesses within the capacity of the magazine can be advanced to a sheet separation station with substantially no lost motion of the cradle and with a minimum expenditure of power and with less wear on the drive mechanism.

The downward movement of the cradle 76 and magazine 96*a* is stopped at the loading position when the cam 88 opens the lower limit switch 90 thereby to de-energize the solenoid 42. Due to the inertia of the apparatus and the tendency of the gear drive to override somewhat because of the flux change in solenoid 42 when it is de-energized, it would ordinarily be rather difficult to stop the magazine in a precise loading position relative to track 282 (FIG. 4) in the loading platform 3. To overcome this difficulty, the cam 88 is so positioned that it will open the lower limit switch 90 as the magazine is stopped by the projections 82 of the stop bar 84 while the cradle 76 coasts downwardly a short distance before it stops. Thus it is seen that the cradle 76 may be retracted rapidly and the magazine 96*a* accurately positioned relative to the track 282 in the loading platform and without any shock imposed on the drive mechanism.

As the sheets 12 are separated individually and successively from the stack in the supply magazine 96*a*, they are delivered into the primary feeding path 6 by the vacuum wheel 14 and advanced through the path and finally stacked in the receiving or stacking magazine 96*b* (FIG. 4) in a manner described in the first mentioned Bradshaw application, Serial No. 830,391, and deposited into the stacking magazine in the same order and face position relative to the indentation or cut-out 112 in the front wall 102 of the stacking magazine 96*b* that they occupied when in the supply magazine 96*a*.

When the magazine is in the stacking position, feeler fingers 252 and 254 depend downwardly by gravity and are moved upwardly each time a sheet 12 is stacked in the magazine 96*b*. The fingers also serve to guide the leading edge of the ejected sheets downwardly to their stacked position in the magazine. When the magazine is full of cards or sheets 12, the fingers 252 and 254 will have been rocked upwardly so that the tab 268 on the finger 252 will extend through the aperture 270 (FIGS. 15 and 16) in the front wall 138 of the partition 116 thus to rock the actuating arm 272 against the finger 314 to open the full-stack switch 322 thereby to de-energize the solenoid 330 and shut off the vacuum to feeding wheel 14. Since no sheets will now be separated from the stack by the vacuum wheel, the sensing switch 114 will remain open and the elevating mechanism inoperative. A signalling device, not shown, may be included in the circuit to indicate to the operator that the stacking magazine 96*b* is full.

From the above description it will now be understood that the invention provides an improved container or magazine for holding sheet-like articles and which may be conveniently adjusted for containing stacks of such articles of various heights or thicknesses within its capacity, and which is further characterized by its utility both as a supply magazine and as a stacking magazine. Its further usefulness as a storage magazine for valuable record sheet material will also be readily understood. In such case, a stack of sheets to be placed in storage is firmly compressed in the magazine between the front wall 102 and the partition 116. It is apparent that such a compressed stack of sheets is less subject to various hazards than a loosely stored stack of sheets.

What is claimed is:

1. A magazine for use in a sheet feeding apparatus having a sheet feeding device, a sheet supply station and

a sheet stacking station, said magazine being selectively positioned in said stations in relatively angular positions for supplying or stacking sheets, respectively, and comprising, an open box-like container having a bottom wall, first and second end walls and first and second side walls, said first end wall having an opening therein for admitting said sheet feeding device to the interior of said container when the magazine is used in said supply station, said side walls each having a rack and a way both parallel to the bottom wall, a movable partition within the container and having a recessed portion adjacent to said first end wall, a rotatable shaft carried by the partition, first and second gears fixed on said shaft and in mesh respectively with said racks, first and second rollers each on one end of said shaft and on said ways respectively for supporting the partition for movement therealong in opposite directions toward said end walls, second and third racks on said first side wall and being normal to the other rack on said wall, third and fourth gears carried by the partition and in mesh with said second and third racks and arranged to rotate as a unit, a second way on said first side wall, a third roller carried by the partition and riding against said second way for spacing said partition from said first side wall, means for spacing said partition from said second side wall, a one-way clutch for restricting rotation of said shaft in one direction, a mechanism carried by the partition for releasing said clutch to allow said shaft to be rotated in either direction, means on said second end wall and cooperating with said releasing mechanism for latching the partition to the second end wall for use of the magazine in said stacking station, and a sheet feeler finger pivotally connected to the partition and being inoperatively received in said recessed portion when the magazine is used in said supply station and depending operatively from said partition for guiding sheets into said container and for gauging the level of sheets therein when the magazine is used in said stacking station.

2. A magazine for use in either of two relatively angular positions in an item processing machine, for supplying sheet-like items to the machine in one position or stacking such items therein in the other position, comprising, a container, a partition within the container movably connected thereto and having a recess in one face thereof, means for locking the partition to the container against movement in one of two directions, means for unlocking the partition to allow movement thereof in either of said directions, a feeler finger pivotally mounted to the partition and being inoperative and received within said recess by the force of gravity when said magazine is in said one position for supplying items and operatively extending from said partition by the force of gravity for gauging the level of items in said container when the magazine is in the other said position for stacking items, and means carried by said partition and responsive to lifting of said finger by successive items when such items are being stacked in said container to actuate an associated shut-off device of said machine to stop the stacking of items in said container.

3. A magazine for use in either of two relatively angular positions in an item processing machine, for supplying sheet-like items to the machine in one position or stacking such items therein in the other position, comprising, a container, a partition within the container movably connected thereto, means for locking the partition to the container against movement in one of two directions, means for unlocking the partition to allow movement thereof in either of said directions, and an item feeler finger pivotally mounted to the partition and being inoperative and disposed against said partition by the force of gravity when said magazine is in said one position for supplying items and operatively extending from said partition by the force of gravity for gauging the level of items in said container when the magazine is in the other said position for stacking items.

4. A magazine as defined in claim 3 wherein said feeler finger in the extended position will be lifted and rocked about its pivotal mounting by successive items when such items are being stacked in said container to actuate an associated shut-off device of said machine to stop the stacking of items in said container when the latter is full.

5. A magazine for use in either of two relatively angular positions in a sheet feeding machine, for supplying sheets to the machine in one position or for stacking sheets therein in the other position, comprising, a container having a bottom wall and at least two other walls, a partition within the container movably connected thereto and having a recess in one face thereof, means for locking the partition relative to one of said walls against movement in one of two directions, means for unlocking the partion to allow movement thereof in either of said directions, a feeler finger pivotally mounted to the partition and being inoperatively received within said recess when said magazine is in said one position and is used for supplying sheets and operatively extending from said partition for guiding sheets into said container and for gauging the level of sheets in said container when the magazine is in the other said position and is used for stacking sheets, means on one of said walls cooperating with said unlocking means for latching said partition in back-to-back relation against said one of said walls when the magazine is used for stacking sheets, and means maintaining said partition perpendicular to said bottom wall comprising, a pair of racks secured to one of said other walls in spaced-apart parallel relation, and a pair of gears rotatably mounted on said partition in spaced-apart relation and in mesh with said pair of racks and arranged to rotate as a unit.

6. A magazine for use in either of two relatively angular positions in a sheet feeding machine, for supplying sheets to the machine in one position or for stacking sheets therein in the other position, comprising, a container having a bottom wall, side walls and end walls, each side wall having a way parallel to the bottom wall, a partition within the container movably connected to said side walls and supported on said ways for movement therealong in opposite directions, said partition having a face for supporting a stack of sheets when the magazine is used for supplying sheets and said face having a recess therein, a clutch for locking said partition against movement in one of said directions, mechanism carried by the partition for releasing said clutch to allow movement of the partition in either of said directions, a feeler finger pivotally mounted to the partition and being inoperatively received in said recess by the force of gravity below said face when said magazine is in said one position and is used for supplying sheets and operatively extending from said partition by the force of gravity for gauging the level of sheets in said container when the magazine is in the other said position and sheets are being stacked therein, and an anchor post secured to one of said end walls and cooperating with said releasing mechanism for latching the partition to said last mentioned end wall when the magazine is used for stacking sheets.

7. A magazine for containing a stack of sheets and like articles comprising, a portable container having side walls and a bottom wall, a first pair of racks one on each side wall and parallel to the bottom wall, a partition within the container perpendicular to said bottom wall and movably connected to said side walls, means including a first pair of coaxial gears in mesh with said racks for supporting the partition for movement along the racks in opposite directions, a clutch restricting movement of said gears and partition to one of said directions, means carried by the partition to release the clutch to allow the partition and gears to be moved in either of said directions, and means maintaining the perpendicularity of the partition relative to said bottom wall comprising, a second pair of racks secured on one of said side walls in spaced

apart relation, a shaft rotatably secured to said partition and having its axis at an angle to the axis of said first pair of coaxial gears, and a second pair of coaxial gears secured on said shaft in spaced apart relation and in mesh with said second pair of racks.

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