(19) Europäisches Patentamt
European Patent Office
Office européen des brevets

(11) Publication number: **0 005 041**
A1

(12) EUROPEAN PATENT APPLICATION

(21) Application number: **79300625.5**

(51) Int. Cl.²: **B 65 H 31/24**

(22) Date of filing: **12.04.79**

(30) Priority: **17.04.78 US 897274**

(43) Date of publication of application:
31.10.79 Bulletin 79/22

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DE FR GB

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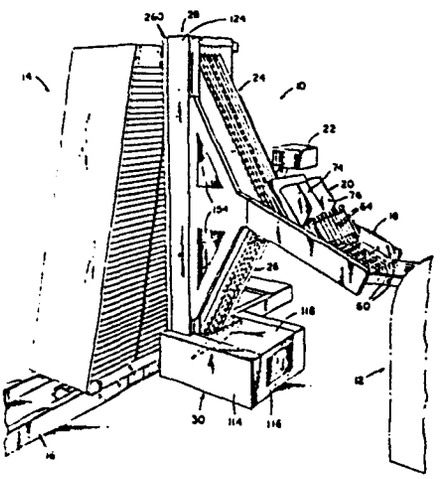
(54) Feeding mechanism for a continuous sorting machine.

(57) Continuous feeder mechanism for a continuous paper sorting machine including a receiver 14 comprised of two columns of inclined side-by-side stacks of paper storage bins with entrances for receiving paper sheets from the feeder 10. The feeder 10 has an in-feed conveyor 18 which takes paper from a copy making device 12 and feeds it either to an intermediate downwardly inclined conveyor 26 or onto an intermediate upwardly inclined conveyor 24, depending on whether the feeder 10 is distributing paper from the bottom or from the top. Paper sheets from the intermediate conveyors 24 and 26 in turn are transported to a generally vertically disposed, reversible feeder conveyor 28 which is provided with a plurality of two-way deflectors which intercept the sheets and direct them off the conveyor 28 moving either downwardly or upwardly. A deflector guide section is disposed between the deflectors and the entrances of the bins in the receiver 14.

FIG. 1



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FEEDING MECHANISM FOR A CONTINUOUS SORTING MACHINE

This invention relates to sheet distributing or sorting devices and more particularly to an apparatus which can continuously sort large numbers of multipaged documents as copies of a particular page proceed from a reproducing device such as a printer or copy making machine. Reference is made to our copending European Patent Application No. 79300624.8 , filed on even dated herewith, entitled "Continuous Paper Sorting Machine" and corresponding to U.S. Patent Application Serial No. 897,272 dated 17th April 1978.

Prior art paper distributors, sorters and/or collators have encountered many problems. One is that the large increase in the costs of labour and materials has made it more imperative that the available press or duplicator capacity be utilized to its fullest. In order for the maximum volume

capability of a printing, duplicating or copy making machine to be utilized, it is necessary that the sorter have the capacity to receive the printer or copy making machine output without undue loss of press or copy making machine time. Large volume sorting machines have been introduced to the market place but they are not continuous. For instance, after a column of trays or bins has been filled, it is necessary to shift that filled colums away from the feeder and nove an empty column into position to continue the sorting job. Thus there is lost a significant amount of press of copy machine production time between columns. Additionally, the time is lost if the bins have tc be unloaded on line.

The differences in the volume of jobs that sorters must handle suggest that sorters should be modular to the extent that if a module does not have the capacity, additional modular receiver bin sections may be provided.

without any substantial loss of time or extra handling of the copied material. While smaller collators or sorters are mainly intended for the office market as a necessary adjunct to office copying machinery, larger sorters are more intended for the high volume commercial market and for large in-plant reproduction centers, commercial houses and printing departments. These higher volume paper handling installations may be turning out catalogs, maintenance manuals, instruction books, brochures, sales material and perhaps other items such as reports, bid specifications and other large quantity multi-page publications. Those skilled in the art will appreciate the savings in labor, time and money if the output of a printing or copying center can be sorted and handled at a rate which is matched to the press and duplicating machinery production capability.

Among the prior art references which may be considered with respect to the features of this invention are the following: United States Patent Nos. 3,420,517; 3,273,882; 3,356,362; 3,848,867; 3,937,459; 3,938,801; 3,740,050; 3,944,217 and 3,963,235. The devices covered

by the above list of patents are considered to be non-anticipatory of the teachings of this invention.

A continuous paper sorting machine in which the receiver with the bin is designed generally in accordance with the teachings of U.S.Patent No.3,938,801 which describes side-by-side stacks of inclined columns of paper

receiving bins or shelves. The receiver of this invention is moved laterally with respect to a generally upright feeding device, in which the feeder is comprised of a base section and an upstanding tower portion. An in-feed conveyor is located generally midway between the top and bottom of the tower and receives sheets of paper from the press or duplicating machinery. A proof tray is supported above the infeed conveyor and a deflector mechanism is provided on the infeed conveyor for directing the sheets either upwardly into the proof tray or to allow the sheets to pass on through to the feeder. At the inner end of the infeed conveyor are an upwardly extending intermediate conveyor and a downwardly extending intermediate conveyor. A deflector at the junction of the infeed and the upward and downwardly intermediate conveyors directs ehets of paper either into the upper intermediate conveyor or onto the downwardly intermediate conveyor depending upon feeder controls programming . A generally vertically disposed reversible feeder conveyor extends between the outer ends of the two intermediate conveyors and receives paper from either direction. The feeder has drive and clutching means for reversing the direction of movement of the feeder conveyor. A series of paper deflectors are located on the feed conveyor and are designed to deflect paper copies from either direction. The deflectors are individually actuated by drive solenoids. A deflector guide section is provided on a hinged frame which swings away from the conveyor to allow access to paper jams and for maintenance. The deflector guide frame is mounted for

pivotal movement so that the guides are precisely located with respect to the entrances to the bins on the receiver.

Accordingly, it is among the features, objects and advantages of the invention to provide a paper sorting machine feeder device which is continuous and uniquely designed and intended for maximizing the production volume of a commercial printing, reproducing, duplicating or copying center. The invention is particularly intended to reduce and to minimize the amount of time a reproduction, printing or copying device loses due to the lack of a continuous paper copy sorting capability which is matched to copy making capacity. Because of the unique feeder in conjunction with the canted columns of bins type of receiver, there is no necessity to stop the sorting of paper copies from column to column. The machine can continue to sort as it moves from tray-to-tray and from column-to-column without interruption of copy production. The receiver can be unloaded off line, so that a filled receiver may be rolled away and an empty receiver moved into position with a minimum of lost time. The invention is particularly suited for use in printing shops or reproduction centers for such things as multi-page brochures, catalogs, books and other items which must be produced in large numbers. The machine is capable of receiving sheets and feeding them at the high speeds of present day advanced copying, printing and duplicating machinery.

Figure 1 is a perspective view showing the general arrangement and organization of the sorter and particularly of the feeder mechanism of this invention;

Figure 2 is a partial top plan view of the infeed conveyor including the proof tray;

Figure 3 is a partial side elevation view in cross-section showing details of the infeed conveyor and details of its construction;

Figure 4 is a partial elevational cross-section view of the machine showing additional details of the intermediate conveyors and of the infeed conveyor section;

Figure 5 is a diagrammatic view showing the arrangement of vacuum inducing fans in the feeder device;

Figures 6 and 7 are diagrammatic views of the conveyor drives and clutching arrangements for reversing the feeder conveyor;

Figure 8 is a partial cross-section view along the line 8-8 of Figure 4 showing additional details of the feeder conveyor construction;

Figure 9 is a partial elevational cross-sectional view along the line 9-9 of Figure 8 showing additional conveyor details; and

Figure 10 is a partial front elevation view of the deflector guide section of the feeder.

Referring now to the drawings and particularly Figure 1, it will be seen that the feeder mechanism of this invention, generally designated by the number 10, is in position between a duplicator or press device generally designated by the number 12 and a receiver mechanism generally designated by the number 14. The receiver moves laterally back and forth on track structure 16. Feeder 10 includes an infeed conveyor section 18, a proof tray assembly 20 and a control panel 22. The infeed conveyor feeds either to a downwardly angled intermediate conveyor 26 or an upwardly angled intermediate conveyor 24. A tower section generally designated by the number 28 supports a vertically disposed reversible feeder conveyor, bin deflectors and guides to be described more in detail hereinafter. The tower section 28 is supported on a base section 30 shown in generally outlined form in Figure 1.

Referring now to Figures 2 and 3, it will be seen that the infeed conveyor 20 includes side frame members 36 in which is supported a conveyor plenum enclosure 38 having an outer end 40 and inner end 42. The conveyor plenum 38 has a wall

46 in which are disposed rows of openings 48. The openings 48 are formed in the wall 46 so as to present transverse as well as longitudinal rows over substantially the entire length of the plenum structure 38. A shaft 50 is supported adjacent the inner end 42 of the plenum and has affixed thereto a plurality of rollers 52. In like manner, at the outer end 40 a shaft 54 has a series of belt rollers 56. A series of belts 58 extend around the rollers 52 and 56 as seen in the drawings. A short section of transfer conveyor belts 60 extend around rollers 62 which are also affixed to shaft 54 to accept the sheets of paper from the press or duplicating device for transfer to the infeed conveyor 18. A fan means 34 is provided in the infeed conveyor for creating vacuum or negative pressure for holding the sheets of paper on the belts 58.

The proof tray structure, generally designated by the number 20 includes proof conveyor belts 64 which extend around pulleys 66 and 68 mounted on shafts 70 and 72 respectively. The proof conveyor feeds to a tray 74 having side walls 76. A proof deflector 80 is mounted on a shaft 82 and is biased into a normal position

such that when power is off the deflector would be in an intercept position with respect to sheets of paper coming onto the infeed conveyor. The proof deflector 80 is actuated by a solenoid 84 as seen in Figure 2. Additionally, a direction deflector 86 is provided at the inner end of the infeed conveyor structure for directing sheets of paper off the infeed conveyor either to the upwardly angled intermediate conveyor 24 or the downwardly angled intermediate conveyor 26. Directional deflector 86 is mounted on shaft 88 and is in turn selectively actuated by the solenoid 90 again shown in Figure 2. The proof conveyor belts and pulleys 64, 66 and 68 are driven by a power belt 92 extending from a drive pulley 94 on shaft 54 to a pulley 96 mounted on shaft 70. The infeed conveyor belts 58 in turn are driven by a belt 98 which extends around drive pulley 100 mounted on shaft 50, again as best seen in Figures 2 and 3.

Figure 4, directed to details of the base 30 and the feeder tower frame 28, shows base 30 to be a generally rectangular box-like structure housing motor 110 and other parts as will be more particularly described hereinafter. Base 30 has

a bottom wall 112, side walls 114, a rear wall 116 and top wall 118. A conveyor frame receiving area is defined by a recessed wall 120 which is spaced a predetermined distance from the front wall 120, and as can be seen, angles upwardly and rearwardly generally parallel to the bottom intermediate conveyor section 26. Supported within the recessed area of the frame are two spaced apart main upstanding or vertical frame members 124 and 126 seen in Figure 4 and also in Figure 8. A horizontal top frame member 128 interconnects main upright frame members 124 and 126. Mounting frame members 128 and 130, as best seen in Figure 8, are secured to the main upright frame members 124 and 126, respectively, for additional frame rigidity as well as for supporting other parts.

Supported between the uprights 124 and 126 is an internal, triangular, inner wall structure generally designated by the number 132. It will be seen by reference to Figure 4 that the wall 132 extends from near the lower end of the uprights to a point near the upper end of the uprights. Extending generally vertically is a wall 134 which with wall 132 defines a triangular enclosed space 136 within a basic frame structure.

A shroud occupied by the fan 140 provides air evacuation means for the lower intermediate conveyor 26 while a fan 144 surrounded by shroud 142 provides air evacuation means for the upper intermediate conveyor 24. Note that the shrouds and fans 138, 140, 142 and 144 are part of the wall structure 132 just described. In the vertical wall 134 are shroud 146 towards the lower part of cavity 136 and shroud 148 towards the upper part of cavity 136. In this regard, see also Figure 5. Shrouds 146 and 148 are occupied by fans 150 and 152, respectively. The air evacuation means direct the air inwardly from the direction of the conveyors and exhaust it through screened openings 154 as shown in Figure 1.

Lower intermediate conveyor 26 includes an elongated generally rectangular plenum wall 160 which has both transverse and longitudinal series of holes 162. At the lower end of the plenum are a series of belt conveyor pulleys 164 mounted on shaft 166. At the upper end of lower intermediate conveyor 26 are a plurality of belt pulleys 168 mounted on shaft 170. Since the sheets of paper must traverse around the lower end of intermediate conveyor 26, the radius of turn is

larger as can be seen by reference to the relative difference between the lower pulleys 164 as opposed to the upper pulleys 168. A series of guide and idler pulleys 172 increase the amount of wrap of the belts 174 around rollers 164 primarily to provide clearance between other parts and belts 174. A series of spaced apart guide plates 176 having a radius of curvature 178 extend along the bottom in non-interfering relationship with belts 174. A plurality of individual guide or pressure rollers 180 are mounted on plates 176 to engage belts 174 as they begin to contact rollers 164. In like manner, a series of rollers 184 also mounted on plates 176 engage the

belts 174 to assist in the positive movement of sheets of paper around the lower end of the intermediate conveyor as the belts leave contact with rollers 164. In this way, paper sheets move positively around the end of the intermediate conveyor to be engaged by the feed conveyor 28 to be described hereinafter. In like manner, upper intermediate conveyor 24 has larger diameter upper belt pulleys 190 mounted on shaft 192 with pressure or paper guide rollers 194 and 196. Lower end pulleys 198 are mounted on shaft 200 with the upper end shaft 192 and the lower end shaft 200 being mounted at the ends of plenum wall 202 having transverse and longitudinal rows of openings 204. Belts 206 extend around the upper and lower pulleys again with idler or wrap-around pulley assembly 208 serving the same function as pulleys 172 at the lower end of the lower intermediate conveyor. Finally, guide plates 210 having a radius of curvature 212 allow a sheet of paper to traverse around the top end of the conveyor to the vertical feed conveyor. It is to be observed that the pressure or retainer rollers 196 and 194 could be mounted individually on the guide plates as shown or on a common shaft or bar extending laterally across.

The feeder conveyor section 28, reference being had to Figures 4 and 8 through 10, has side frame members 220 and 222 which attach to and extend between the vertical mounting pieces 129 and 130 as seen in Figure 8. At the upper end of feeder conveyor 28 are belt pulleys 224 mounted on shaft 226 and at the lower end are pulleys 228 mounted on shaft 230. A series of belts 232 extend around the upper and

lower pulleys 224 and 228 and idler or guide roller assemblies with pulleys 234 are mounted at spaced intervals between the upper and lower end pulley assemblies as seen in Figures 8 and 9. A series of deflectors numbering 51 in total are spaced between the frame members 220 and 222, said deflectors being generally designated by the number 240. The deflectors 240 are made of light aluminum sheet and are formed with a front wall 242 which when in retracted position is generally parallel to and as can be seen, slightly rearward of the carrying or paper contact surface of the belts so that the front walls of the deflectors in retracted position do not interfere with the movement of paper with the belts. The deflectors are also formed with a top wall 244 which is generally at right angles and extending rearwardly from the front face 242 to define deflector edges 243. The front faces 242 are provided with openings 246 extending rearwardly on the topwall 244 in the form of opening 248, as best seen in Figures 8 and 9. Mounting ears 250 at the ends of the deflectors 240 are received in triangular holes in frame pieces 220 and 222. Each of the 51 deflectors is provided with a depending actuating tab 252 engaged by solenoid 254. It will be seen particularly by reference to Figure 8 that light compression springs 256 are disposed between the tabs 252 and the solenoids 256 so that the deflectors are normally biased into their retracted position as seen in Figure 4. Upon energization of the solenoid the deflectors are pivoted outwardly around the ears 250 to move the deflectors into an intercept or deflecting position with respect to

pieces of paper moving either downwardly or upwardly on belts 232. Thus the edge 243 formed by the intersection of the front face 242 and the top wall 244 of the deflectors is extended outwardly so that the front surface 242 and top surface 244 are each at approximately a 45° angle to the belts.

Figures 4, 8 and 10 show details of the deflector guide assembly generally designated by the number 260 which include side frame members 262 and 264 with one side 264 being provided with a hinge 266 for swinging the deflector guide assembly away from the face of the feed conveyor. Extending horizontally between the side frame members 262 and 264 are the generally Y-shaped guide deflectors indicated by the number 268. The guide deflectors have a horizontal outer section 270 and an upwardly angled inner arm 272 and a downwardly angled inner arm 274. It will be noted by reference to Figure 4 that the outer end of the horizontal section 270 of the deflector guides terminates approximately midway between the openings to bins in the receiver. When the deflectors 240 are rotated or pivoted outwardly to intercept a piece of paper the edge 243 is approximately midway between the lower angled arm 274 and the upper angled arm 272 of adjacent deflector guides. Thus, a sheet of paper coming from the top of the feeder conveyor will be deflected into a given bin address by one deflector and if approaching its bin address from the bottom of the feed conveyor will be deflected into the same address by the next lower deflector. Since there are 50 bins in the receiver and 50 guide deflectors 268, it is necessary that there be 51 deflectors in order to properly

address sheets of paper into the available bins. An opening 276 extends all the way from the top to the bottom of the deflector guide assembly 268 to accommodate the light and photocell components 280 and 282 as seen at the bottom and top of the feeder conveyor tower in Figure 4.

A clutching and drive assembly is shown diagrammatically in Figure 7 and includes motor 110 and a drive pulley 111. The drive pulley drives belt 113 which in turn drives pulley 115 on shaft 166 at the bottom of lower intermediate conveyor assembly 26. Note in Figure 6 that a belt 98, also seen in Figure 2, is used to transfer power from the lower intermediate conveyor 26 to the upper intermediate conveyor 24 and also to the infeed conveyor 18. A belt 92 at the outer end of the infeed conveyor drives the proof conveyor belts. Thus, it will be seen that the motor 110 drives all of the conveyor sections of the feeder. In order to reversibly drive feeder conveyor belts 232 two clutch assemblies 117 and 119 are driven by a belt 121 through a lower pulley 123 and an upper pulley 125. A reversing drive belt 127 connects drive power to lower shaft 230 of the reversible feed conveyor through

pulley 231. When clutch 117 is engaged, the feeder conveyor is moved to transport paper upwardly from the bottom. When the lower clutch 119 is engaged, the feeder conveyor will transport paper from the top down. It will be seen by reference to Figure 4 that a horizontally disposed contact roller 290 near the top and a horizontal roller 292 near the bottom are supported on the feeder to engage the receiver 14 as it moves laterally by the feeder to prevent contact and to maintain a predetermined distance relationship between receiver and feeder.

Operation of the feeder and receiver is continuous and is best described as follows. A first or page "1" master is inserted in the press or duplicator. Several copies are first directed to the proof tray and then the sorting job begins. Odd numbered pages coming out of the press are directed to lower intermediate conveyor 26 and up the feeder conveyor to the top bin. Sheets will be fed up the conveyor 232 and deflected to the desired bin address by a deflector and the lower surface of a Y-shaped deflector. The receiver moves a discrete distance from left to right and presents the next bin address until all 50 bins in a column have been filled. If the sorting job extends to the next column copies continue to be fed to the feeder conveyor via lower intermediate conveyor 26 and up the feeder conveyor to the topmost bin in the second column. The topmost bin of the second column is offset from the lowermost bin of the first column by the same increment of distance as the bins are offset from each other in each column. Assuming that two complete columns of bins are being used for a sorting job, the feeder continues to feed around the lower intermediate conveyor until all fifty bins in the second column are filled. By the time the bottom-most bin in the second column has received its copy of page 1 from the press copies of the page 2 master are already proceeding up the upper intermediate conveyor. The feeder belts 232 are reversed to bring the first sheet from the top to the bottom of the feeder conveyor and filling of the bins with copies of page 2 begins with the lowest bin in column 2 where the first page sorting job ended. Thus the feeding

of bins is continuous not only from bin to bin but from column to column. Also, it can be appreciated that odd numbered pages from the duplicator are fed from the bottom up while the receiver indexes from left to right and even numbered pages are fed from the top down while the receiver moves from right to left. Obviously, also, two adjacent deflectors are needed for a single bin address. When coming down the conveyor sheets are deflected by the top one of two adjacent deflectors and directed against the top surface of a deflector guide and into the bin opening. When coming from the bottom the sheet is deflected by the lower one of two adjacent deflectors and off the lower surface of a deflector into the same bin address. Thus the need for one more deflector than there are bins or guides.

CLAIMS:

1. A generally upright continuous feeder mechanism for a paper sorter having a receiver in which said receiver includes columnar stacks of inclined side-by-side paper storage bins means with entrances for receiving paper sheets from said feeder, said receiver being detachably mounted for lateral movement relative to said feeder mechanism, said feeder mechanism comprising;

a) a main supporting frame including a base section and an upstanding tower section,

b) a first infeed conveyor means for receiving sheets of paper to be sorted from a paper copy-making device and having a receiving end and a discharge end, said first conveyor means including directional deflector means at its discharge end for selectively directing sheets of paper to a second or third intermediate conveyor means,

c) a second intermediate conveyor means for receiving paper sheets from said first conveyor means for transporting sheets of paper to the upper end of a feeder conveyor means,

d) a third intermediate conveyor means for receiving paper sheets from said first conveyor means for transporting sheets of paper to the lower end of a feeder conveyor means,

e) generally vertically disposed fourth feeder conveyor means in predetermined spaced relation to the entrances of said bin means and which is reversible so as to selectively receive paper sheets from said second and third conveyor means, said fourth feeder conveyor also including a plurality of bin deflector means for selectively directing paper sheets into said bin means as the said paper sheets proceed along said fourth conveyor means either from the top or from the bottom,

f) means for moving all said conveyor means, means for selectively reversing said fourth feeder conveyor means and means for selectively actuating all said deflector means.

2. The continuous feeder mechanism according to Claim 1 and in which a plurality of paper guide means are provided generally between said bin deflector means and the entrances to said bin means for assisting in directing sheets of paper to said bin means.

3. The continuous feeder mechanism according to Claim 2 and in which said plurality of paper guide means are mounted on a secondary frame pivotally attached to said tower section so that said paper guide means may be swung away from said fourth conveyor means and said bin deflector means.

4. The continuous feeder mechanism according to Claim 1 and in which said intermediate second and third conveyor means angle upwardly to the upper end and downwardly to the lower end respectively of said fourth feeder conveyor means.

5. The continuous feeder mechanism according to Claim 1 and in which a drive and clutching means are located in the base section of said main supporting frame for effecting rapid reversal of said fourth feeder conveyor means.

6. The continuous feeder mechanism according to Claim 1 and in which a proof or paper receiving tray is located above said first infeed conveyor for selectively receiving sheets of paper from said first infeed conveyor means, and further including a proof deflector means near the receiving end thereof for selectively guiding sheets of paper off said infeed conveyor means and to said proof tray.

7. The continuous feeder mechanism according to Claim 6 and in which said a fifth proof conveyor means is disposed generally between said proof deflector means and said proof tray for conveying sheets of paper to said proof tray.

8. The continuous feeder mechanism according to Claim 1 and in which all of said conveyor means are comprised of a plurality of generally equally spaced apart, minimum area cross-section, individual continuous belt strips which present a minimum amount of contact with said sheets of paper to reduce the driven conveyor mass and to reduce the

static electricity charge in the paper sheets and conveyor system, said individual belt strips being mounted on drive and idler rollers to minimize friction in the conveyor system.

9. The continuous feeder mechanism according to Claim 1 and in which are evacuating means are provided for creating a vacuum for all of said conveyor means for assisting in the transport of sheets of paper on all said conveyors.

10. The continuous feeder mechanism according to Claim 1 and in which said plurality of bin deflector means are provided with individual solenoid means for selectively actuating each bin deflector means as determined by the control system.

11. A generally upright continuous feeder mechanism for a paper sorter receiver in which said receiver includes columnar stacks of side-by-side paper storage bins having a generally perpendicular entry side for receiving paper sheets from said feeder, said receiver being detachably mounted for bidirectional movement at a predetermined speed along a track which is generally at a right angle to the direction in which paper sheets are fed to said receiver bins, said columnar stacks

of bins being inclined at a predetermined angle from the vertical along the path of movement of said receiver, said feeder mechanism comprising:

a) a first infeed conveyor means for receiving sheets of paper to be sorted from a paper copy-making device and having a receiving end with a discharge end, said first conveyor means including a directional deflector means at its discharge end for selectively directing sheets of paper upwardly and downwardly;

b) a generally upwardly angled second intermediate conveyor means for receiving paper sheets from said first conveyor for transporting sheets of paper upwardly to the upper end of a feeder conveyor,

c) a generally downwardly angled third intermediate conveyor means for receiving paper sheets from said first conveyor for transporting sheets of paper downwardly to the lower end of a feeder conveyor,

d) a generally vertically disposed fourth feeder conveyor means which is generally parallel and in predetermined spaced relation to the entry side of said receiver and which is reversible so as to selectively receive paper sheets from said second and third conveyor means, said fourth feeder conveyor also including a plurality of bin deflector means registering with the entrance to said bins in said receiver for directing paper sheets into said bins as the said paper sheets proceed along said fourth conveyor either from the top or from the bottom,

e) a plurality of guide means provided on said feeder mechanism between said fourth feeder conveyor and the entrance to said bins for guiding sheets from said fourth conveyor and deflectors into said bins, and

f) means for moving all said conveyor means, means for selectively reversing said fourth feeder conveyor, and means for selectively actuating each of said bin deflector means.

12. The continuous feeder mechanism according to Claim 11 and in which said plurality of paper guide means are mounted on a secondary frame pivotally attached to said tower section so that said paper guide means may be swung away from said fourth conveyor means and said bin deflector means.

13. The continuous feeder mechanism according to Claim 11 and in which a drive and clutching means are located in the base section of said main supporting frame for effecting rapid reversal of said fourth feeder conveyor means.

14. The continuous feeder mechanism according to Claim 11 and in which a proof or paper receiving tray is located above said first infeed conveyor for selectively receiving sheets of paper from said first infeed conveyor means, and further including a proof deflector means near the receiving end thereof for selectively guiding sheets of paper off said infeed conveyor means and to said proof tray.

15. The continuous feeder mechanism according to Claim 14, and in which said fifth proof conveyor means is disposed generally between said proof deflector means and said proof tray for conveying sheets of paper to said proof tray.

16. The continuous feeder mechanism according to Claim 11 and in which all of said conveyor means are comprised of a plurality of generally equally spaced apart, minimum area cross-section, individual continuous belt strips which present a minimum amount of contact with said sheets of paper to reduce the driven conveyor mass and to reduce the static electricity charge in the paper sheets and conveyor system, said individual belt strips being mounted on drive and idler rollers to minimize friction in the conveyor system.

17. The continuous feeder mechanism according to Claim 11 and in which air evacuating means are provided for creating a vacuum for all of said conveyor means for assisting in the transport of sheets of paper on all said conveyors.

18. The continuous feeder mechanism according to Claim 11 and in which said plurality of bin deflector means are provided with individual solenoid means for selectively actuating each bin deflector means as determined by the control system.

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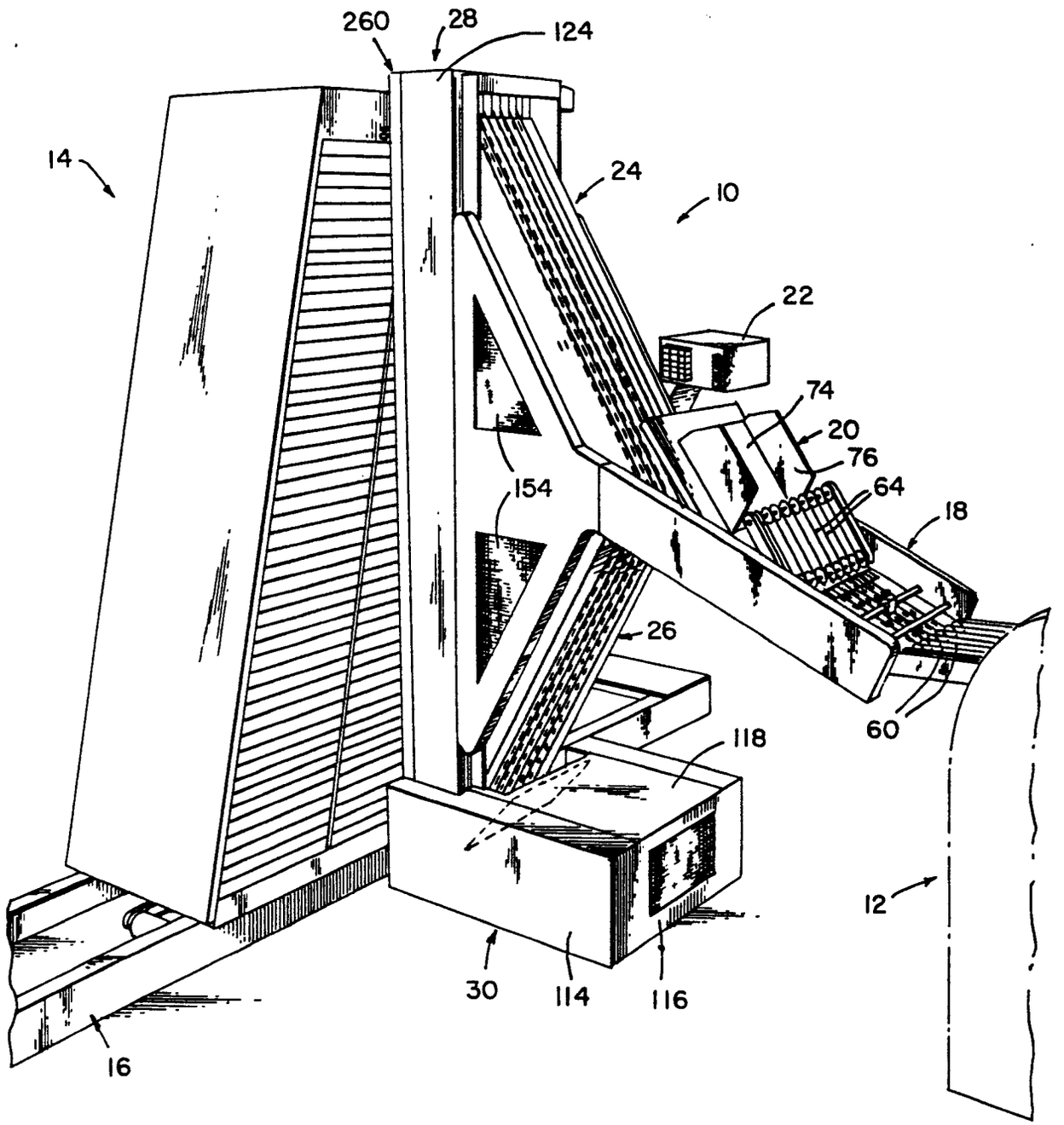
FIG. 1



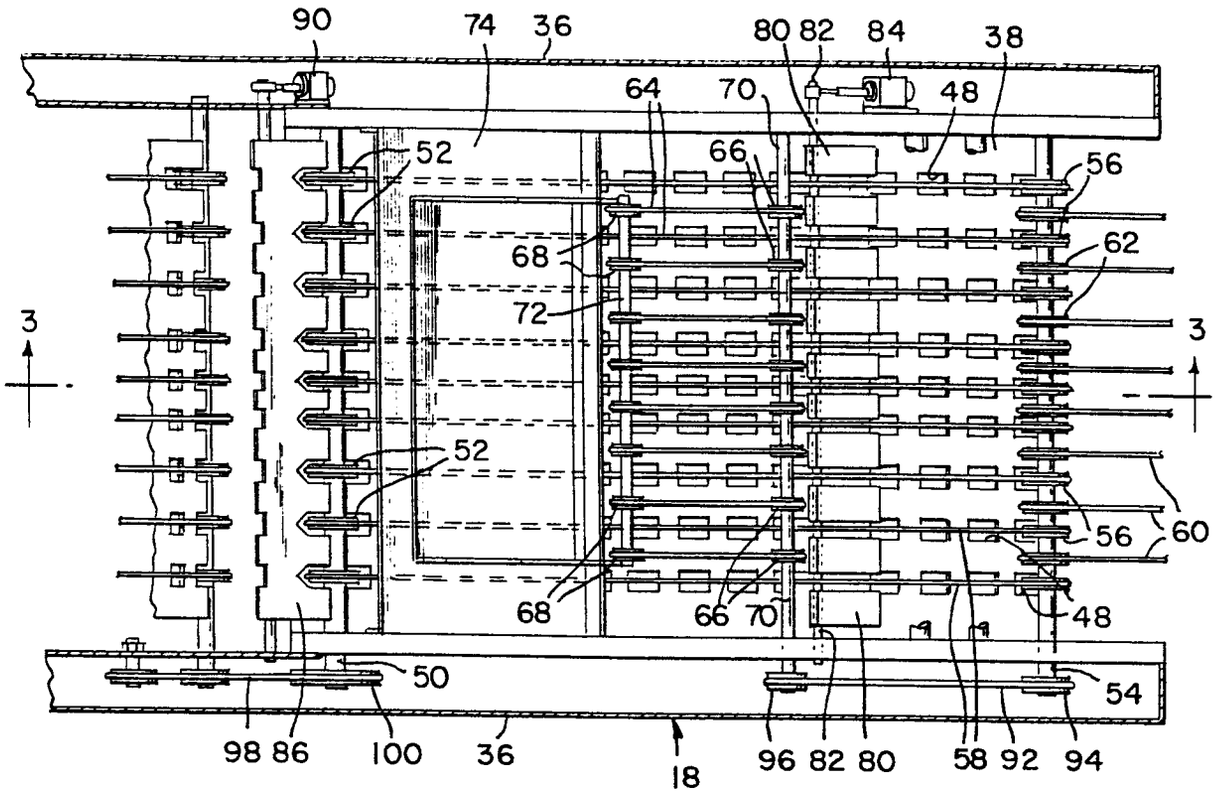

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FIG. 2

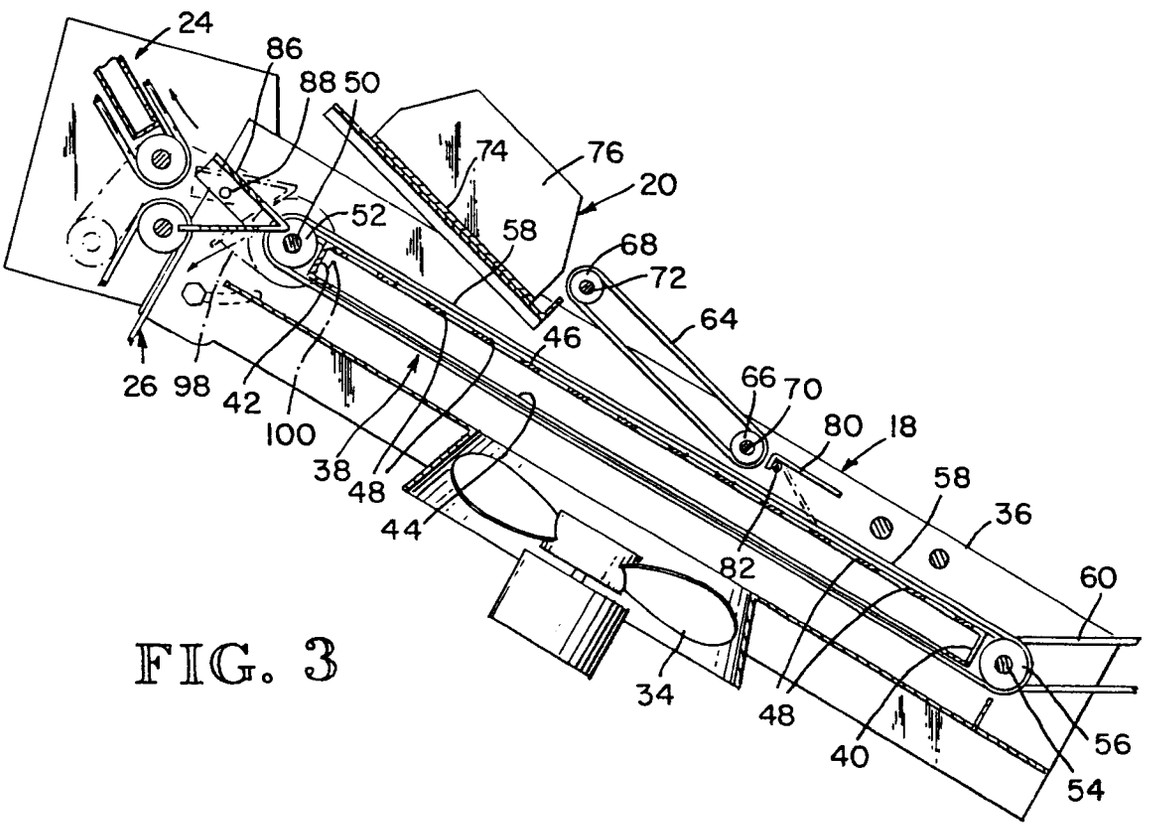
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FIG. 3

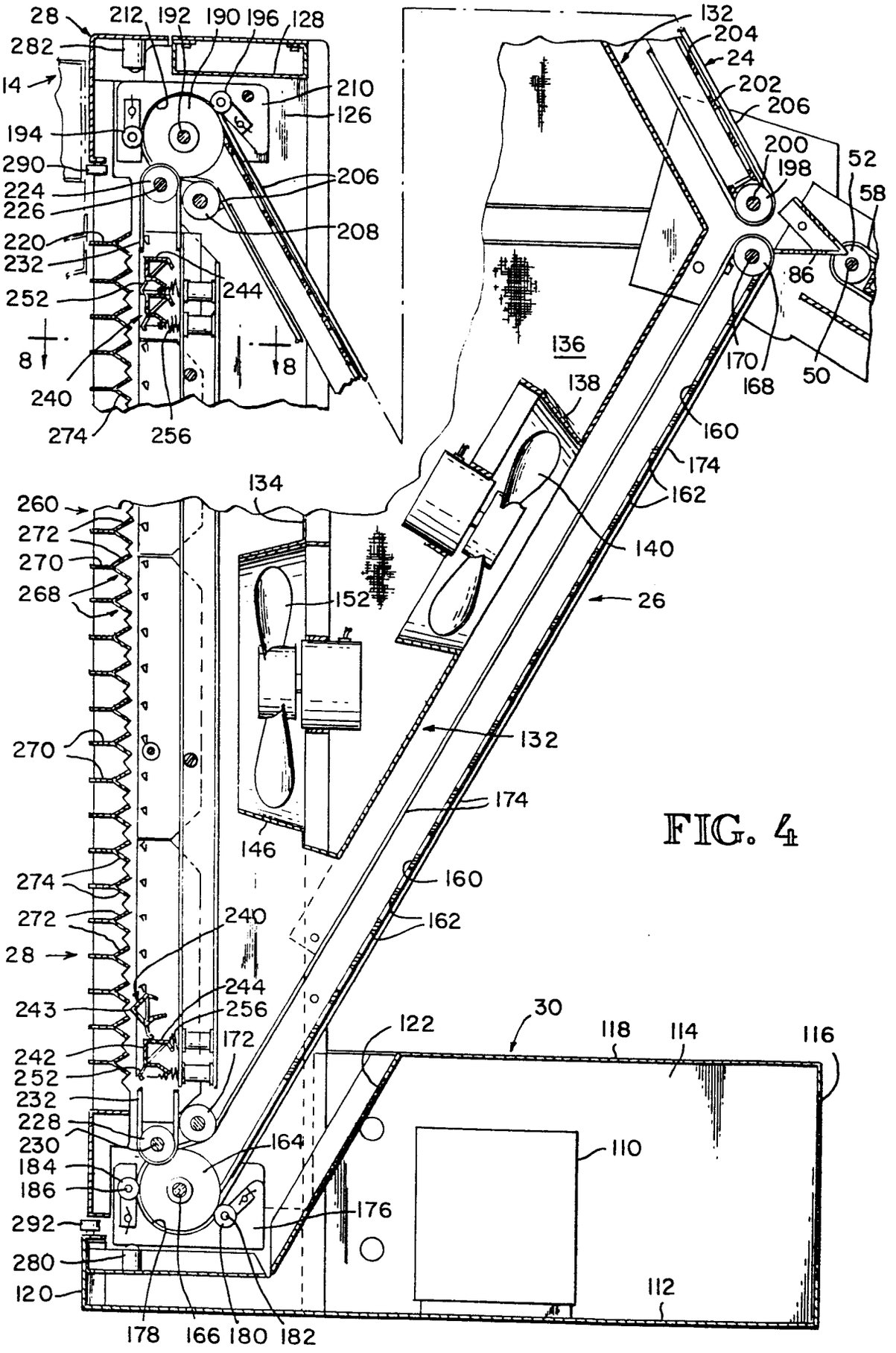
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FIG. 4

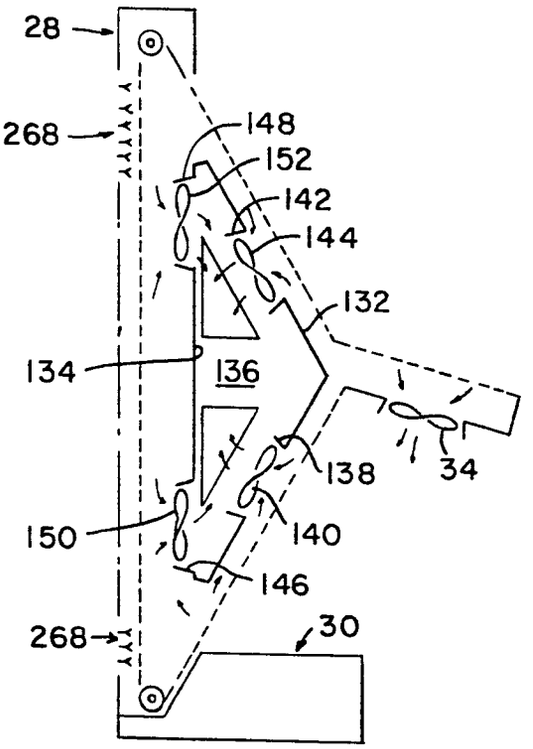


FIG. 5

FIG. 7

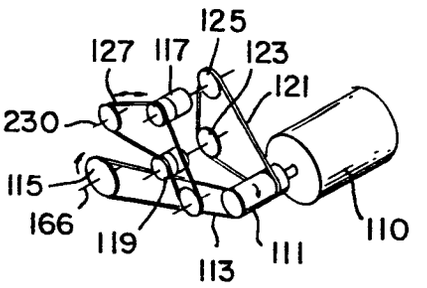


FIG. 6

FIG. 8

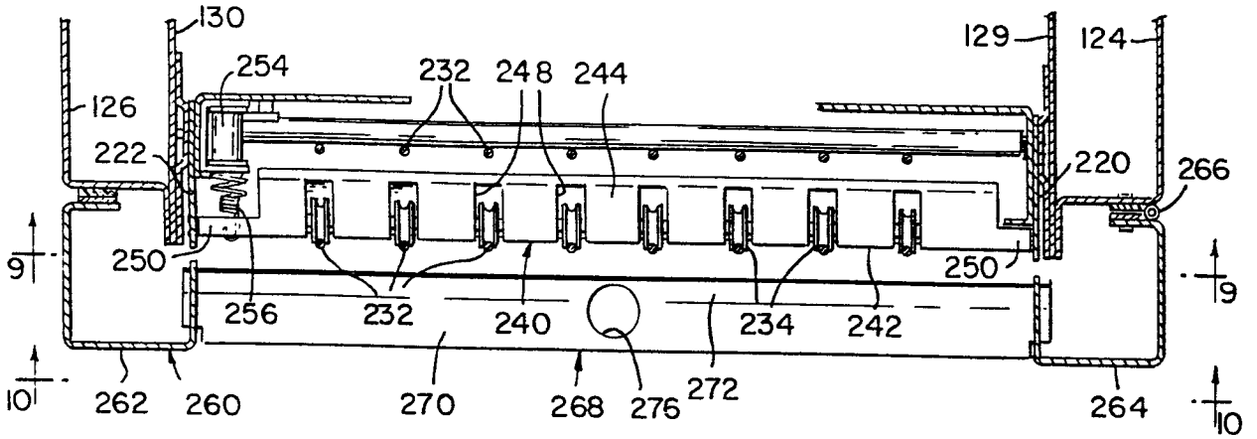


FIG. 9

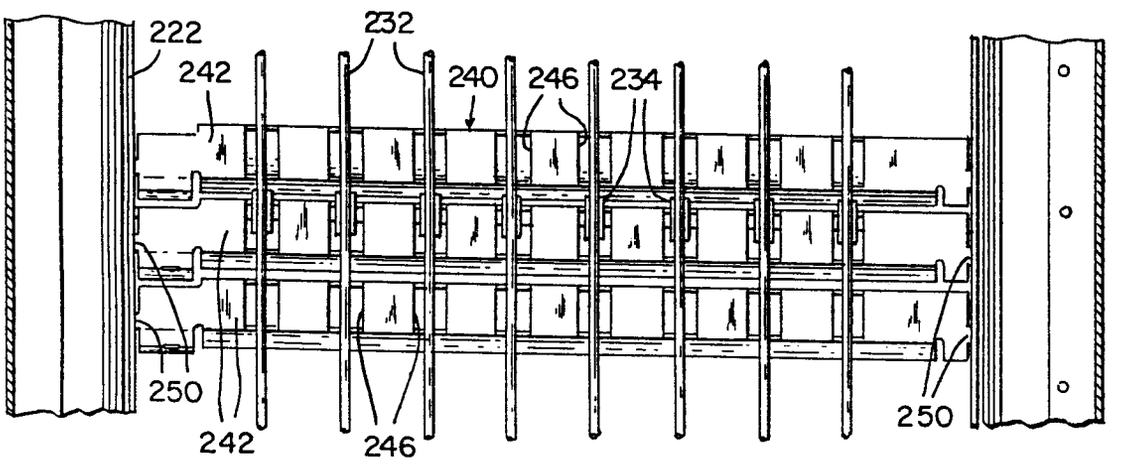
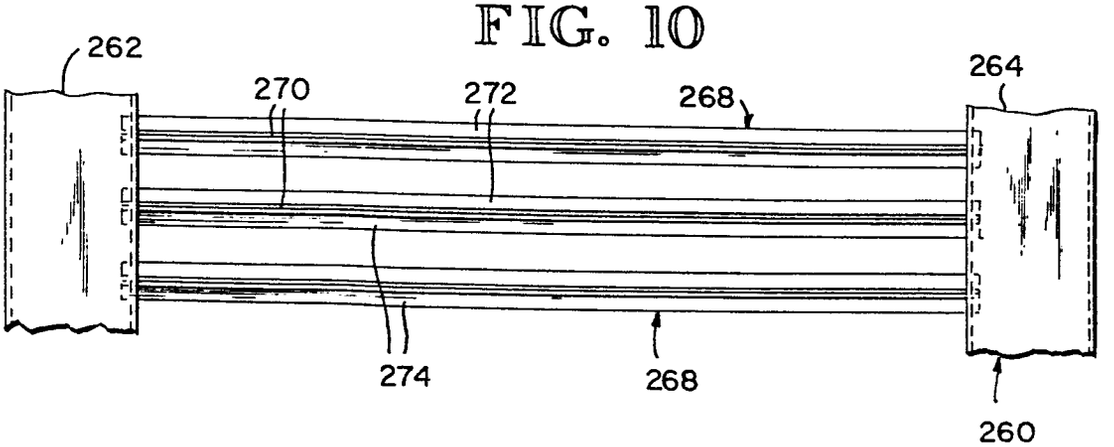


FIG. 10



European Patent Office

EUROPEAN SEARCH REPORT

Application number
0005041
EP 79 30 0635

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim
D,A	US - A - 3 963 235 (NORFIN) * the complete description * ---	1
D,A	US - A - 3 938 801 (HOLLIDAY) * the complete description * ---	1

CLASSIFICATION OF THE APPLICATION (Int. Cl.²)

B 65 H 31/24

TECHNICAL FIELDS SEARCHED (Int.Cl.²)

B 65 H
B 07 C

CATEGORY OF CITED DOCUMENTS

X: particularly relevant
A: technological background
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P: intermediate document
T: theory or principle underlying the invention
E: conflicting application
D: document cited in the application
L: citation for other reasons

&: member of the same patent family, corresponding document

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
The Hague	04-07-1979	LONCKE

EPO Form 1503.1 06.78