Sept. 25, 1962 G. A. MEAD 3,055,516

REAM SEPARATOR

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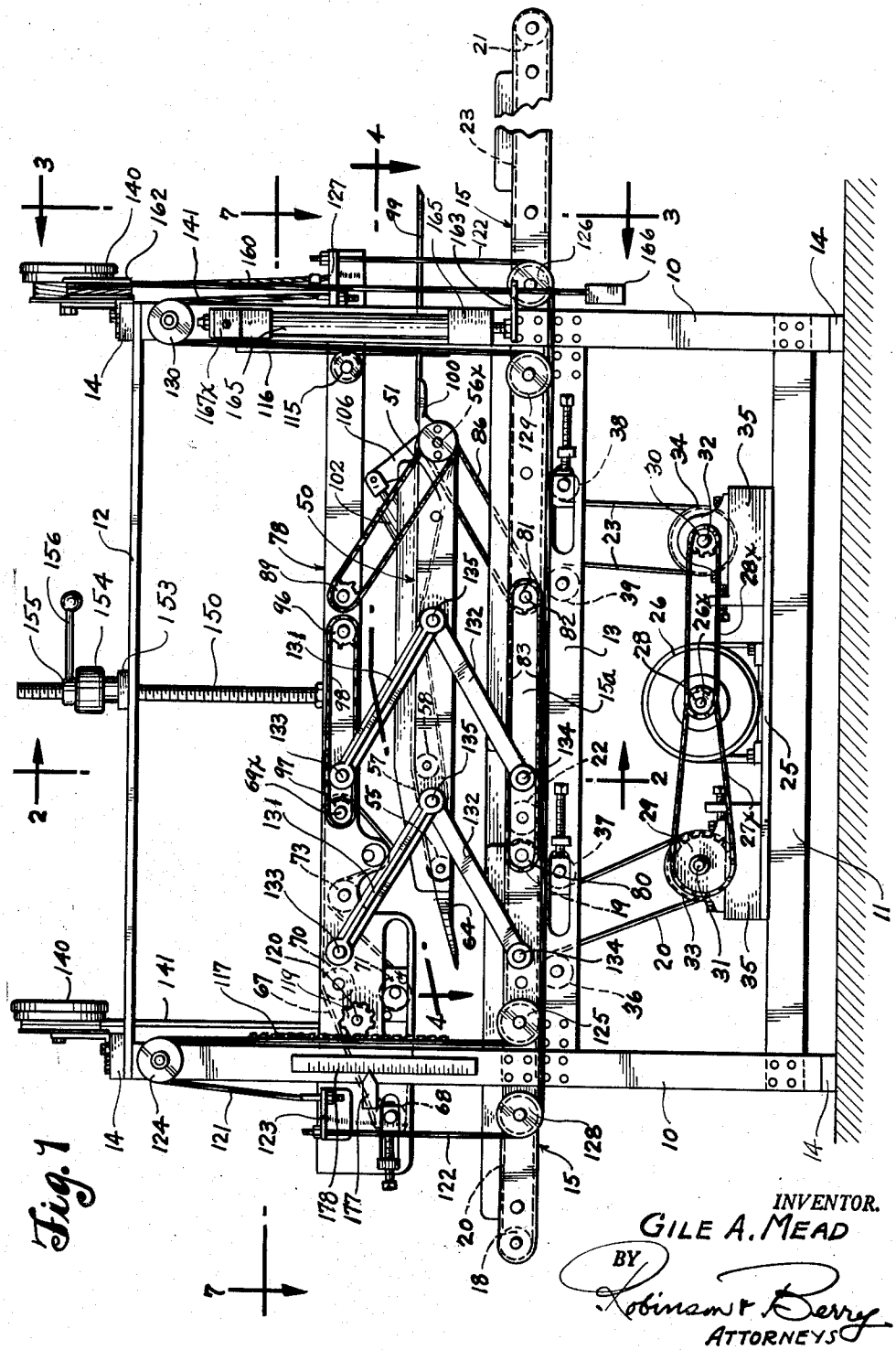


Fig. 1

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Fig. 2

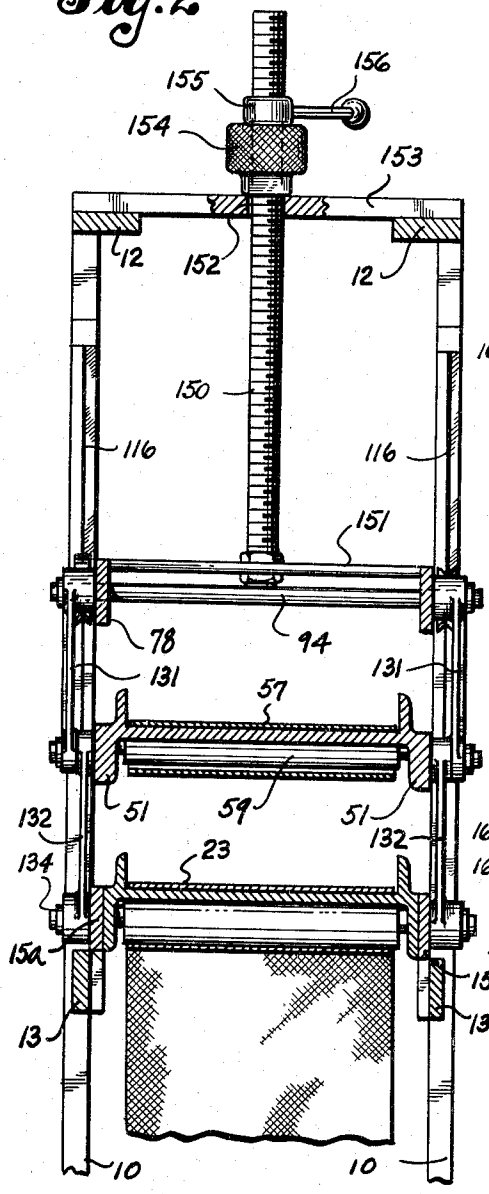
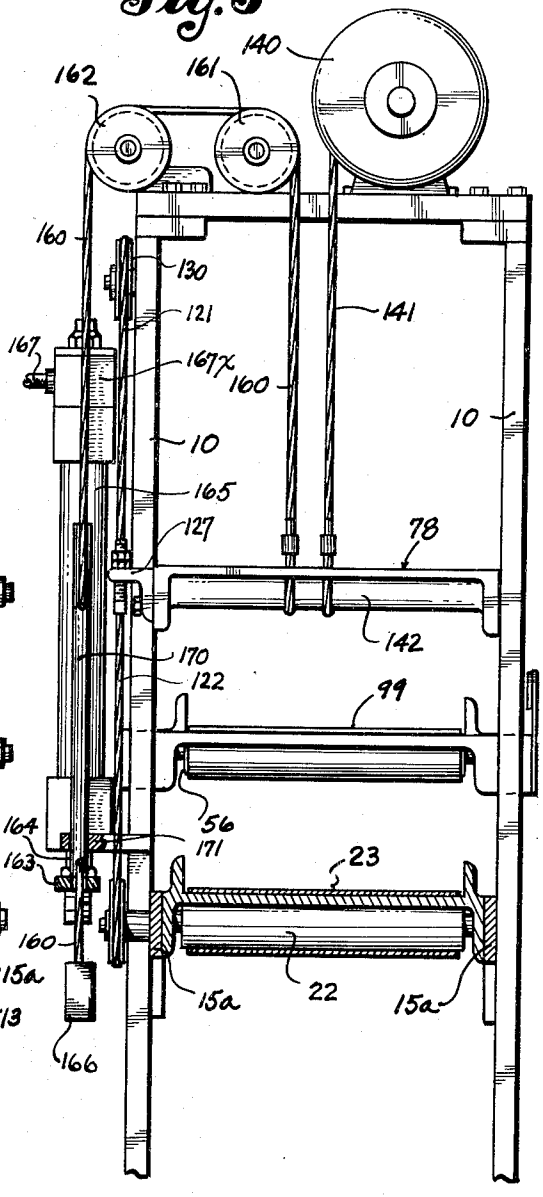


Fig. 3



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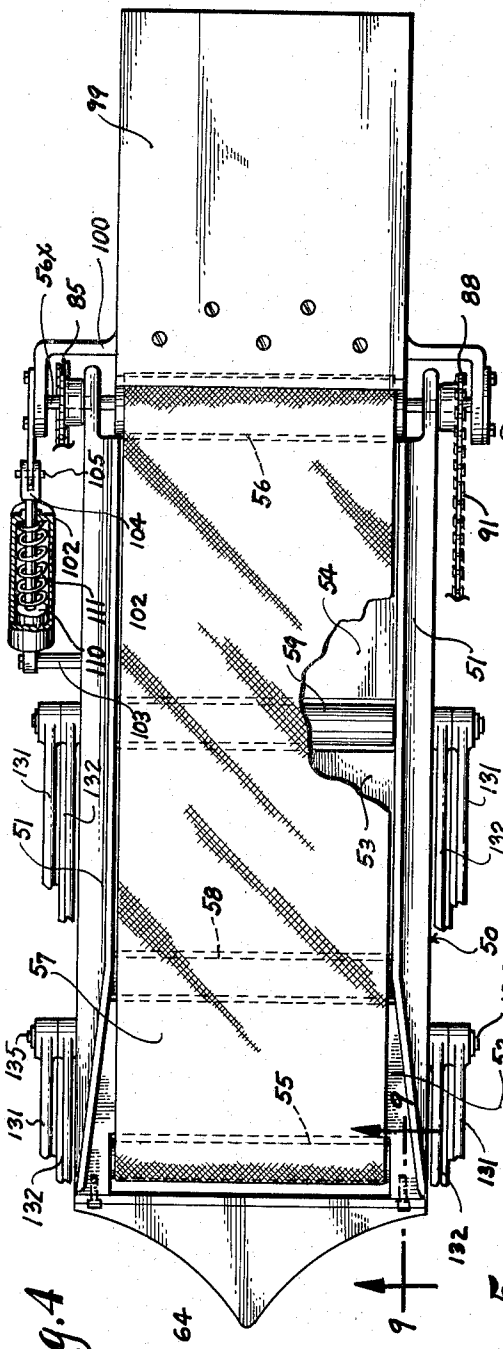


Fig. 4

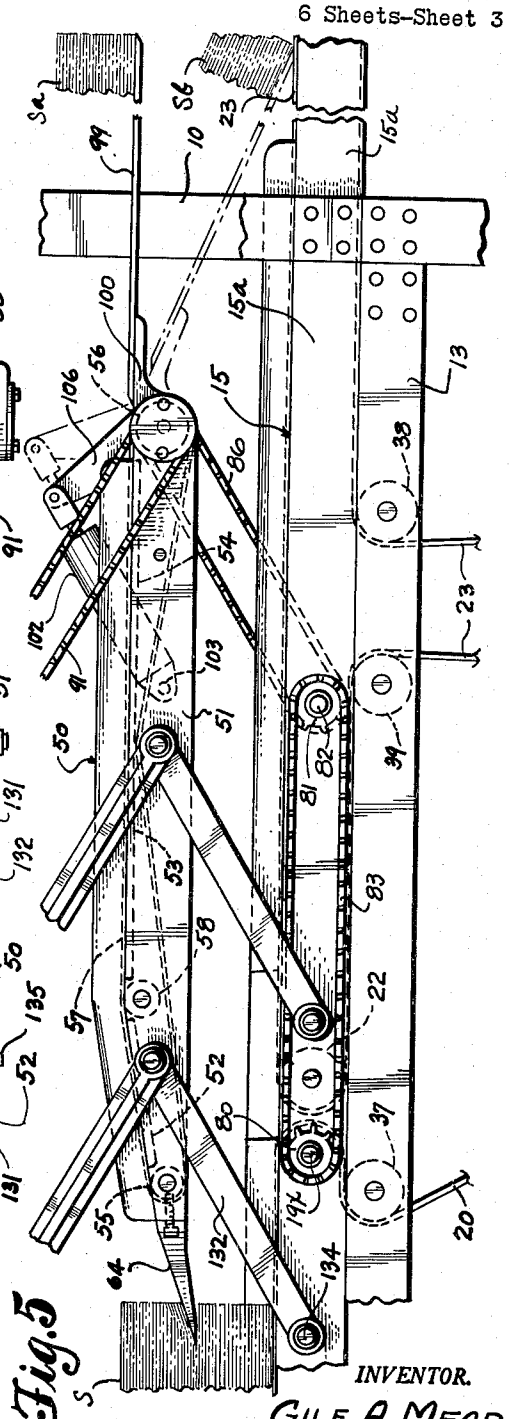


Fig. 5

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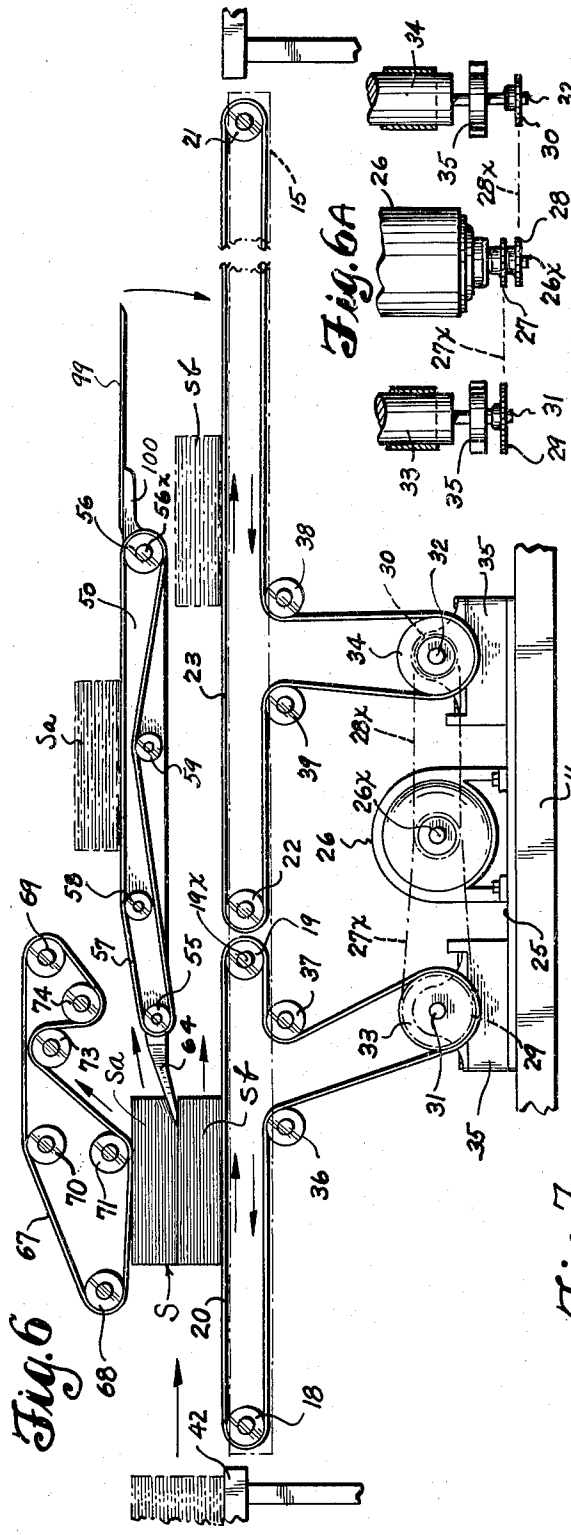


Fig. 6

Fig. 6A

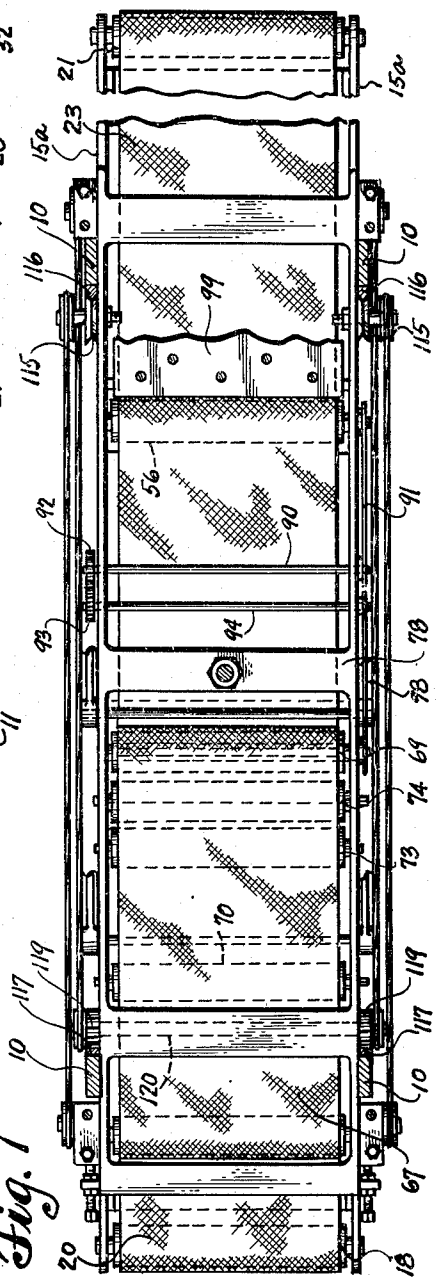


Fig. 7

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Fig. 8

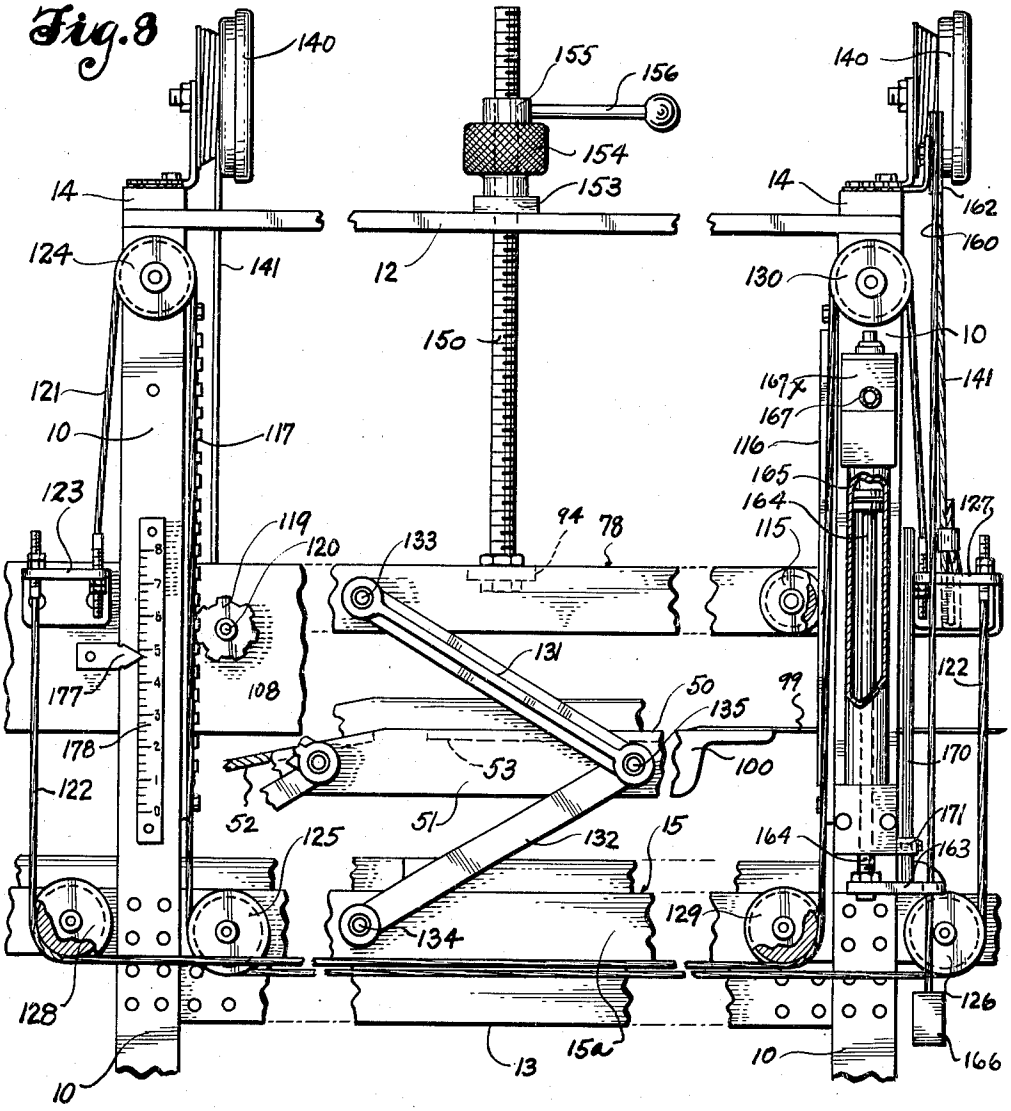
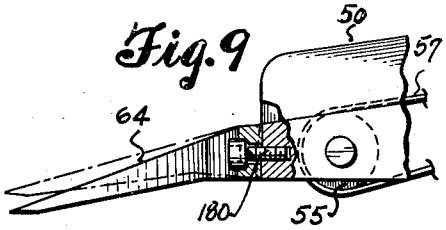


Fig. 9



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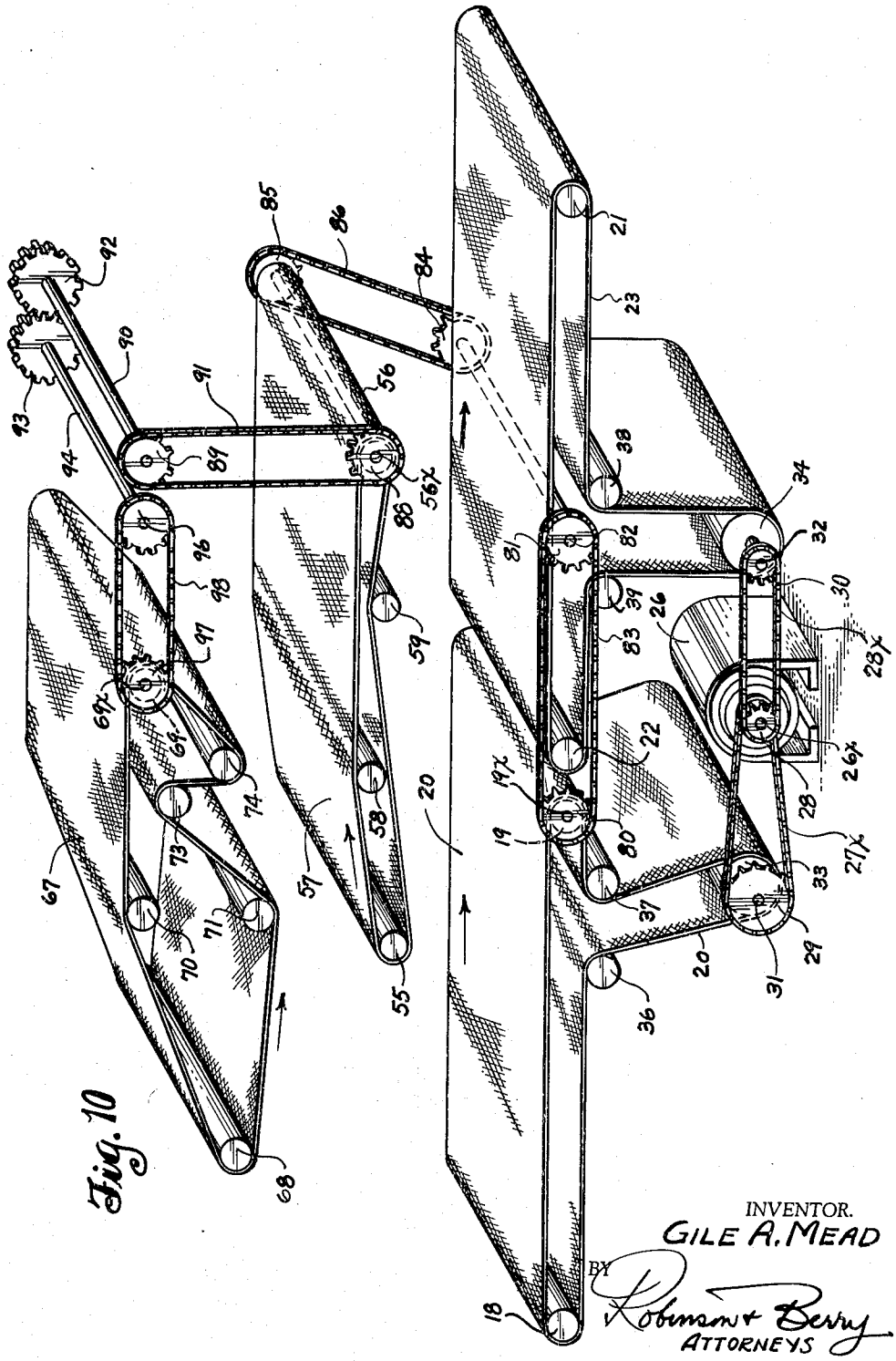


Fig. 10

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3,055,516

REAM SEPARATOR

Gile A. Mead, Hoquiam, Wash., assignor to Lamb Grays Harbor Co., Inc., Hoquiam, Wash.

Filed Feb. 5, 1959, Ser. No. 791,338
9 Claims. (Cl. 214—8.5)

This invention relates to machines which are designated or referred to by persons in the paper industry as "ream separators," such machines being employed for equally dividing a stack of paper sheets, as for example, to divide a stack of paper sheets that is two reams high into two stacks, each one ream high.

In the paper industry, it is most expedient to pile the large paper sheets, as they come from the trimmer, in stacks two reams high for cutting them lengthwise into "logs" which are then cut transversely into blocks or sections of "letter size" sheets. These blocks, which remain two reams high, are then each divided into ream high stacks for individual packaging. Heretofore, this dividing of the two ream high stacks after being cut to letter size blocks has been done manually, and to facilitate it, one or more sheets of paper of contrasting color are placed in the stacks of large sheets, as formed, between the reams. Then after the stacks have been divided into logs, and the logs have been cut into blocks, each block will contain a part of the sheet of contrasting color and its location will designate the line of separation to provide the individual reams of paper for packaging.

In a co-pending application filed on January 28, 1959 under Serial No. 789,640, I have described and illustrated a machine for cutting paper logs that are two reams high, into blocks or sections of letter size paper. It is for the dividing of the two ream high blocks or sections into one ream high stack that the present invention is to be employed.

It is the principal object of the present invention to provide a machine, which is known as a "ream separator," for the automatic, expeditious and accurate dividing of stacks of paper sheets into two stacks of equal height.

It is also an object of the present invention to provide a stack divider or ream separator of the character above stated whereby the equal dividing of the stack, or separation of the reams is accomplished while the stack is being conveyed and which machine includes means therein whereby the two separated parts of the divided stack are placed in alignment, one ahead of the other on a conveyer for their advancement from the machine.

It is a further object of the invention to provide a machine of the character above stated wherein provision has been made for the passing of stacks of various heights therethrough, and means whereby a stack separating blade will be automatically adjusted in accordance with the height of the stack to divide it into two stacks of equal heights.

Further objects and advantages of the invention reside in the details of construction of various parts of the machine; in their combination and in their mode of operation, as will be hereinafter be fully described.

In accomplishing the above mentioned and other objects of the invention, I have provided the improved details of construction, the preferred forms of which are illustrated in the accompanying drawings, wherein:

FIG. 1 is a side elevation of a ream separator embodying the improvements of the present invention therein.

FIG. 2 is a vertical cross-section of the machine, taken on the line 2—2 in FIG. 1.

FIG. 3 is an elevation of the machine, as seen from the stack discharge end.

FIG. 4 is a horizontal section of the machine taken on line 4—4 in FIG. 1, particularly showing the stack dividing or ream separating unit.

FIG. 5 is a side view of the parts shown in FIG. 4.

FIG. 6 is a view showing the arrangement and relationship of coacting conveyor belts as employed in the machine.

FIG. 6A shows, in top view, the driving connections as made between the motor shaft and conveyor belt driving rollers.

FIG. 7 is a horizontal section taken on line 7—7 in FIG. 1 showing, in plan view, the relationship of conveyor belts.

FIG. 8 is a side view of a part of the machine, with parts broken away in order to shorten the view, showing the cable system for equalizing the up and down adjustment of opposite ends of the upper belt carrier frame and the stack separator unit.

FIG. 9 is a sectional detail showing the manner of mounting the stack dividing blade.

FIG. 10 is a schematic showing of the conveyor belts and their driving connections with the electric motor.

Referring more in detail to the drawings:

As shown best in FIGS. 1, 2 and 3, the present machine comprises a rigid and substantial frame structure, rectangular in form and of metal construction. It comprises vertical posts or legs **10**, of equal height at its four corners, which posts are joined at opposite sides of the machine, across their lower ends by horizontal bars **11**. Likewise, they are joined across their upper ends by flat horizontal bars **12** and between their upper and lower ends, by horizontal bars **13**. At the opposite ends of the frame, the legs **10** are joined across their lower and upper ends by cross-bars **14**. All parts are joined in such manner as to retain the frame structure perfectly rigid.

Fixed in this frame structure, immediately above the horizontal bars **13** at each side, are the opposite side bars **15***a*—**15***a* of a conveyor belt mounting frame structure designated in its entirety in FIG. 1 by reference numeral **15**; these bars being disposed against the inside of the legs **10** and bolted thereto. Extended between and rotatably mounted by these bars **15***a*—**15***a* at the receiving end of the machine and in the relationship best shown in FIG. 6, are rollers **18** and **19** about which a continuous conveyor belt **20** is mounted for travel. Likewise, extended horizontally between the bars **15***a*—**15***a* and rotatably mounted thereby, are rollers **21** and **22** about which a continuous conveyor belt **23** is extended. It is shown in FIG. 1 that the bars **15***a*—**15***a* extend substantially beyond the opposite ends of the frame and that the top runs of the belts **20** and **23** as mounted between them provide a substantially continuous conveying surface extending the full length of frame **15** onto which paper stacks can be placed at the receiver end of the machine and will be delivered thereby to its discharge end as presently fully explained.

The driving means for the conveyor belts **20** and **23** has been shown in FIGS. 1, 6, 6*a* and 10, and will now be described. Mounted on the longitudinal bars **11** of the frame structure, midway of the ends of the machine, is a base plate **25** on which an electric motor **26** is securely mounted with its drive shaft **26***x* directed transversely of the machine. Mounted on one end of this shaft are sprocket wheels **27**—**28**, seen in FIG. 6A, of equal diameter; these being in alignment respectively, with sprocket wheels **29** and **30** that are fixed on the supporting and driving shafts **31** and **32** of belt driving rollers **33** and **34**; these rollers being mounted on the base plate **25** by means of bearing blocks **35**, as shown in FIGS. 1 and 6 in which their shafts rotate. Sprocket chain belts **27***x* and **28***x* op-

erate about the aligned sprocket wheels to drive the rollers.

It is shown in FIG. 6 that the conveyor belt **20** which extends along the frame **15** a distance about one-third of its length, after passing about the rollers **18** and **19** extends over and between rollers **36** and **37** that are mounted by and between the frame bars **13** and from these it passes about the driving roller **33**. Likewise, the conveyor belt **23**, after passing around the supporting rollers **21** and **22** extends over and between rollers **38** and **39**, mounted between the bars **13—13**, and is then drawn about the driving roller **34**.

It is further shown in FIG. 6, that the top run of the belt **20** and that of belt **23** are in the same horizontal plane and their adjacent ends are quite close together so that conveyed stacks will pass easily from belt **20** onto belt **23**. Also, it is to be explained that the sprocket wheel **29** through which belt **20** is driven, has a diameter that is twice that of sprocket wheel **30**; this being best shown in FIG. 6A. Therefore, when the motor **26** drives the sprockets **27** and **28**, which are of equal diameter, the belt driving roller **34** will be driven at twice the speed of belt driving roller **33**, and the lineal speed of belt **23** will be twice that of belt **20**. It is also to be noted that the driving connection provides that the top runs of the belts **20** and **23** will move in the same direction for the conveyance of stacks of paper sheets, such as that designated at S in FIG. 6, from left to right in the showing of FIG. 6. It is also understood that stacks S in passing from belt **20** onto belt **23** will be moved by the latter at twice the speed of their travel when conveyed on belt **20**. The reason for this speed differential will presently be apparent.

Assuming that a stack of paper sheets, such as that designated by reference character S, has been moved from the feed table designated at **42** in FIG. 6, onto the receiving end of belt **20**, it will be advanced by the belt to the stack separating unit. This has been shown in FIGS. 1 and 4 to comprise a horizontally supported frame structure designated in its entirety by reference numeral **50**. This structure, as noted best in FIGS. 4 and 5, comprises parallel, opposite side rails **51—51** that are rigidly joined in spaced relationship by flat plates **52**, **53** and **54** that are extended between them flush with their top edges, to serve as belt supports. Mounted transversely of and within this frame structure, at its forward and rearward ends, are belt carrying rollers **55** and **56** about which a continuous conveyor belt **57** is applied and drawn tight. Between its ends the top run of belt **57** is supported by a transverse roller **58**, and rearwardly of roller **58** the lower run of the belt is supported by a transversely mounted roller **59**; both rollers being mounted in the frame structure **50**. It is also to be noted, more particularly by reference to FIGS. 5 and 6, that the top run of the belt **57** is upwardly inclined at a low angle from roller **55** to roller **58** and then continues horizontally to roller **56**. It is also shown in FIG. 6 that the lower run of belt **57**, after passing roller **55**, is supported at a slightly higher level.

The forward end of frame structure **50** terminates near the rear end of belt **20**, and at this end is equipped with the ream separating plate **64**. This plate extends horizontally across the forward end of the frame and in a downwardly inclined position as well shown in FIGS. 5 and 6. In plan view, plate **64** is of the triangular form shown in FIG. 4 and its point is directed forwardly in the central longitudinal vertical plane of the machine. As best shown in FIG. 9, this point forming portion of plate **64** tapers to a thin, wedge shaped stack dividing edge that is adapted, when a stack of paper is advanced on belt **20** against it as illustrated in FIGS. 5 and 6, to horizontally divide the stack without stopping its forward travel. The position of the plate permits the lower divisional part of the stack to continue advancement on belt **20** while the upper part is diverted across the top surface of the separating plate **64** onto the top run of belt **57** for conveyance rearwardly thereon.

In order that the upper division of the stack will not be misaligned and will be caused to continue to move in accordance with the advancement of the lower half after the stack engages the point of the dividing plate **64**, an overhanging belt drive, as seen in FIG. 6, is provided therefor. This drive comprises the continuous belt **67**, mounted above and aligned with belt **20**, and operatively extended at its forward end about a supporting roller **68**, and at its opposite end about a driving roller **69** which is at a higher level than roller **68**. The top run of this belt is supported between its ends by a transverse roller **70** at the level of roller **69** and the lower run is engaged and deflected downwardly at a slight inclination from roller **68** by a transverse roller **71** that is positioned slightly forward of the stack entering point of the plate **64**. It is noted also in FIG. 6 that the belt **67** passes in an upward direction from roller **71**, over a roller **73** and then downwardly about the underside of a roller **74**, and then upwardly to roller **69**. All rollers which engage belt **67** are mounted in a horizontal frame structure, not shown in FIG. 6, but which is shown in FIGS. 1 and 7 and is designated in its entirety in these views, by reference numeral **78**; this frame being horizontally disposed and supported for guided vertical adjustment between the four corner posts **10** of the main frame structure as shown in FIG. 7 and as presently explained.

The driving of the belts **57** and **67** is effected by the following means: Roller **19** as mounted by a shaft **19*x*** on which it is keyed, is driven by the belt **20** as the belt travels about it. The shaft **19*x*** extends rotatably through the frame **15** and at one end has a sprocket wheel **80** fixed thereto. Sprocket **80** is aligned with a sprocket wheel **81** of the same diameter that is fixed on one end of a cross-shaft **82** which extends through the frame **15** rearwardly of roller **22**. A chain belt **83** operates about the sprockets **80** and **81** to drive the shaft **82**. Fixed on the other end of shaft **82** is a sprocket wheel **84** which is aligned with a sprocket wheel **95** of the same diameter fixed on one end of the mounting and driving shaft **56*x*** of the belt carrying roller **56**. A chain belt **86** operates about the sprockets **84** and **85** to drive the roller **56**, and it is through this connection that belt **57** is driven.

Fixed on the end of shaft **56*x*** opposite that end which carries belt wheel **85**, is a sprocket wheel **88** which is aligned with a sprocket wheel **89** of the same diameter that is fixed on one end of a cross-shaft **90** mounted horizontally in frame structure **78**. A chain belt **91** operates about the sprockets **88** and **89** to drive the shaft **90**. At its opposite end, shaft **90** is equipped with a gear wheel **92** in driving mesh with a gear **93** of the same size fixed on one end of a cross-shaft **94** rotatably mounted in frame **78**. At its other end, the cross-shaft is equipped with a sprocket wheel **96** which is aligned with a sprocket wheel **97** of the same size fixed on the mounting and driving shaft **69*x*** of roller **69**. A chain belt **98** operates about these aligned sprocket wheels.

With the belts **20**, **57** and **67** mounted in the manner shown in FIG. 6, and operating at the same lineal speeds in the directions indicated by the arrows adjacent thereto in these views, and assuming also that they are supported in proper vertical spacing relative to each other for operation on stacks of a definite height, it will then be understood that when the paper stack S is placed on the receiving end of belt **20** and advanced toward the ream separating plate **64**, the downwardly inclined run of the belt **67** that extends between rollers **68** and **71** will engage the top of the stack and press downwardly thereagainst. Then, when the point of the ream separating plate **64** engages and enters the stack, as in FIG. 6, this belt pressure holds the upper divisional part, designated at S*a*, against any misalignment relative to the lower part and also will cause it to move up the inclined top surface of the plate **64** and onto belt **57** while the lower part of the stack, designated at S*b*, continues its forward advancement on belt **20**, from which it is delivered onto the receiving end of the top run of belt **23** for conveyance at the higher rate of travel to the discharge end of the machine.

The upper part of the divided stack S*a* is conveyed on belt **57** along the frame **50** and is delivered therefrom at its rear end onto a flat plate **99** which is yieldingly supported from frame **50** at the same level as the top run of the belt. The flat plate **99** is supported by a bracket **100**, as shown in FIG. 4, to swing about the drive shaft **56***x* of roller **56**, from the horizontal position in which it is shown in FIG. 5 to the downwardly inclined position in which it is shown in dotted lines. Thus, when the plate **99** receives the stack S*a* from the belt **57**, it swings downwardly and the stack slides therefrom onto the belt **23** and is conveyed thereby from the machine.

The normal horizontal position of the slide plate **99** is retained by means shown in FIGS. 4 and 5 wherein **102** designates an air cylinder, mounted pivotally at its lower end by a stud **103** fixed in a side rail of frame **50**. A piston rod **104** extends from the upper end of the cylinder and is pivotally fixed, as at **105** to a lever arm **106** fixed to one end of the plate mounting bracket **100**. At its inner end the piston rod carries a retarding piston **110** and a coiled spring **111** is interposed between the piston and upper end of the cylinder. This operates to yieldingly retain the plate **99** in the normal horizontal position and permits a retarded downward swinging movement when the stack S*a* moves onto it, thus to ease the delivery of the stacks onto the belt **23**. When unloaded, the spring returns the plate **99** to horizontal position but its upward swing is damped by the trapping of air in the cylinder below the piston, which is loose or ported for a controlled flow of air through it.

The upper frame structure, designated in its entirety by numeral **78** is vertically adjustable in the main frame structure to accommodate the machine to stacks of different height. It is shown in FIG. 7 that, at the right hand end, grooved wheels **115—115** are mounted on the opposite side rails of the frame to travel on vertical guide rails **116—116** fixed to the legs **10—10** at that end of the frame. It is also shown in FIG. 7 that rack bars **117—117** are fixed vertically to the inside edges of the legs **10—10** at the other end of the frame, and that gears **119—119** are fixed on opposite ends of a cross-shaft **120** that extends rotatably through the forward end portion of the frame **78** and are meshed with the rack bars **117—117**.

The horizontal position of the frame **78** is maintained by a use of taut cables arranged as shown in FIGS. 1 and 8; two cables being used at each side of the machine; these being designated by reference numerals **121** and **122**. Cable **121** is shown to be anchored at one end to a bracket **123** that is fixed to the side rail of the frame **78** at the receiving end of the machine. The cable extends upwardly from the bracket, passes over a sheave wheel **124** that is mounted for rotation on the upper end of the adjacent leg **10**, thence downwardly about the underside of a sheave wheel **125** mounted on the side rail **15***a* of frame **15**, thence extended to the opposite end of the frame, about the underside of a sheave wheel **126** thence upwardly therefrom and is anchored to a bracket **127** that is fixed on the side rail of frame **78** at the discharge end of the machine.

The cable **122** likewise is attached at one end to bracket **123**, extends downwardly therefrom, about the underside of a sheave wheel **128** fixed on a side rail **15***a* of frame **15**, at the receiving end of the machine, thence extends to the opposite end of the machine, about the underside of a sheave **129** fixed to the side rail **15***a*, thence upwardly about the top side of a sheave **130** mounted on the upper end of leg **10** at that end of the machine and then downwardly and anchored to the bracket **127**. Cable connections are alike at both sides of the machine. The cable system provides that the frame **78** will be maintained level in its lengthwise direction for all vertical adjustments made, and the rack and gear connection will maintain the frame **78** level in its transverse direction.

The frame **50** is supported at each side by two pairs of parallel links designated by numerals **131—131** and **132—132**. Links **131—131** comprising the upper pair, are pivoted at their upper ends to the siderails of frame **78** at the same horizontal level, as at **133—133**. The other pair of links **132—132** are pivoted, as at **134—134**, to the side rail of frame **15**; these pivot points also being at the same horizontal level and in vertical alignment with the pivot points **133—133**. The lower ends of links **131—131** are pivotally joined to the upper ends of links **132—132** and to the side rails of frame **50**, as at **135—135**. All links are of the same length and joined links are in angular relationship, as shown. With the frame **78** so supported, any change in elevation of the upper frame **78**, as may be required to accommodate it for the reception of stacks S of different height, causes a change in the position of the frame **50**. It will be understood also that when the position of the frame **50** has been so adjusted relative to the incoming stacks that the plate **64** will operate to equally divide the incoming stacks, any change in vertical adjustment of frame **78** will, through the parallel linkage, automatically effect an adjustment in level of the frame **50** that will cause the plate **64** to continue to equally divide the incoming stacks. Thus, stacks of paper two reams high may be equally divided into two stacks, each one ream high.

It is required that the elevation of the frame **78** be stabilized at a predetermined level for stacks of any given height. This is accomplished in the present instance by use of spring loaded cable winding devices **140** that are mounted at opposite ends of the frame structure on the cross bars **14** as shown in FIG. 1. A cable **141** extends downwardly from each of these devices and these are attached under tension at their lower ends to cross bars **142** fixed in the opposite ends of the frame structure **78** as shown in FIG. 3. The tension on the cables is slightly less than that required to balance the weight of the frame **78** and parts carried by it.

The downward movement of the frame **78** is adjustably limited by a vertical screw **150** that is shown in FIG. 2 to be fixed at its lower end to a cross-member **151** of the frame **78** approximately midway of the ends of the frame, and it extends upwardly from frame **78** through a hole **152**, shown in FIG. 2, formed in a cross-bar **153** that extends between and is fixed to the frame bars **12—12**. Threaded onto the screw to engage with the top of cross-bar **153** is a knurled nut **154**, and above it is a lock nut **155** equipped with a handle **156**. When the proper elevation of frame **78** has been established for a stack of any particular height, then the nut **154** is adjusted down along the screw to engage rail **154** and is locked by tightening nut **155** against it. This limits downward movement of frame **78**.

The setting of frame **78** is so adjusted that the entering stack S as shown in FIG. 6, will properly engage the belt **67**; it being intended that this belt shall cause a light downward pressure to be exerted against the entering stock in order to cause a proper advancement of the upper half across the separating plate **64** and onto belt **57**.

It is sometimes desirable to feed stacks S through the machine without dividing them. In such instances the frames **50** and **78** are elevated so that the plate **64** will clear the stacks as advanced on belt **20**. To effect this elevation of the frames, easily and quickly, I have provided the means shown best in FIGS. 3 and 8 wherein **160** designates a cable that is attached at one end to the cross-member **142** at one end of frame **78** and extends upwardly therefrom, over sheave wheels **161** and **162**, mounted on the adjacent cross-member **14** and thence downwardly from wheel **162** and passes freely through a hole in a horizontal arm **163** that is fixed to the lower end of a piston rod **164** that extends from the lower end of an air cylinder **165** that is fixed vertically to the adjacent frame corner post **10**. At its lower end and a short distance below the arm **163**, the cable has a block **166** fixed thereto. Air under pressure is adapted to be admitted from a supply line **167** to the upper end of

the air cylinder under control of a solenoid valve **167***x*. When it is desired to lift the frame **50** to clear incoming stacks, the valve is opened, admitting air to the upper end of the cylinder. This acts on the piston rod **164** to drive it downwardly. The arm **163** fixed to the rod, engages block **166** and pulls downwardly on cable **160** and thus operates to lift the frame **78**, and through it, to lift the frame **50**.

It is shown in FIG. 8 that a vertical guide rod **170** is fixed at its lower end to arm **163** and slides through a guide **171** fixed to the lower end of cylinder. This maintains the proper position of the cable.

With the machine so constructed it is to be understood that stacks S may be placed on belt **20** and advanced thereby into the machine, passing below belt **67** moving at equal speed, which presses yieldingly downwardly against it, as it engages the stack dividing plate **64**. The plate equally divides the stack and the lower half moves from belt **20** onto the faster moving belt **23**, while the upper half continues, at the entering speed, onto belt **57** and from it onto plate **99** from which it is discharged onto belt **23**. Feeding of stacks S into the machine is so timed that there will be sufficient space between the divisional parts S*b* on belt **23** to receive the divisional parts S*a* between them. The ratio of the speed of belts **20** and **23** may be changed if desired by using a larger or smaller sprocket wheel **29**.

Adjustment of frame **78** to accommodate stacks of various heights may be easily and readily done by reference to a pointer **177** that is fixed to the frame **78** in position to follow a graduated scale **178** fixed vertically to a post **10** as shown in FIG. 1, and with each vertical adjustment of frame **78**, the frame **50** will automatically position itself for the equal division of the stack S by the plate **64**. Stacks of any height, within limits, may be separated.

The shafts which carry rollers **37**, **38** and **74** are mounted in eccentric bearings of conventional form for ready adjustment as may be required to tighten or loosen the belts.

The supporting tension applied through cables **141** may be changed through adjustment of the spring loaded devices **140** to provide for ready movement of the frame **78**.

It is also a feature of this invention that the ream or stack dividing plate **64** is supported at its base edge from the forward end of frame **50** by laterally spaced bolts **180**, as shown in FIG. 9. These bolts are so attached to the plate that the forward point of the blade will have slight, limited vertical movement. This permits the plate, to automatically adjust itself in the event that its point should strike against the end edge of a sheet of paper or card in the stack, and not between sheets.

What I claim as new is:

1. A machine of the character described comprising a rigid main frame structure, a horizontally moving conveyor means mounted therein at a fixed level for the advancement of paper stacks in succession thereon into the machine, a horizontal frame structure adjustably supported in said main frame structure substantially above said horizontally moving conveyor means, means for effecting and retaining vertical adjustments of said horizontal frame structure, a conveyor frame disposed horizontally in said main frame structure between said horizontally moving conveyor and said horizontal frame structure, a conveyor belt operable along said conveyor frame, a stack separation plate mounted by and projecting from said conveyor frame to engage and horizontally divide said paper stacks as advanced into the machine by said horizontally moving conveyor means, and to effect the delivery of the upper divisional portions of said stacks to the conveyor belt as mounted in said conveyor frame, paired links arranged in parallel relationship at opposite sides of the conveyor frame and pivotally connected thereto at their upper ends and extending downwardly therefrom and pivotally connected at their lower ends to said main frame structure, other paired parallel links, equal in lengths to those first mentioned, pivotally connected at their lower ends to said conveyor frame at opposite sides and extended upwardly therefrom and pivotally connected at their upper ends to said horizontal frame structure; said paired links providing supports of toggle form for said conveyor frame whereby it is automatically vertically adjusted in accordance with vertical adjustments of said horizontal frame structure.

2. The machine of claim 1 wherein said horizontal frame structure is equipped at the stack receiving end of the main frame structure with a driven feed belt having a part thereof disposed to be engaged by the top surfaces of entering stacks as they are advanced toward and against the separation plate, thus to effect the advancement of the upper divisional parts of said stacks across said separation plate and onto the conveyor belt as mounted in said conveyor frame, and wherein said horizontal frame structure is vertically adjustable in said main frame to accommodate said feed belt to stacks of different height, and wherein the toggle forming linkage operates automatically with the adjustment of said horizontal frame structure to adjust the level of the conveyor frame and said separation plate accordingly.

3. The machine of claim 2 wherein said horizontally moving conveyor means comprises a first belt, on which the stacks are delivered into the machine, and a second conveyor belt which receives the lower divisional portions of said stacks from said first belt; said second belt being driven at a lineal speed substantially greater than that of the conveyor belt in the conveyor frame.

4. A stack separating machine of the character described comprising a horizontal first conveyor means on which stacks of sheets are conveyed into and through the machine, a conveyor frame supported above and extending along said first conveyor means, a stack separating plate extending from said conveyor frame and positioned thereby in the path of said stacks as conveyed into the machine, and a second conveyor means supported by said conveyor frame to receive thereonto the upper divisional portions of said stacks advanced across said separating plate, and a stack lowering plate movably mounted adjacent the discharge end of said conveyor frame and extending beyond said frame and over said first conveyor means, a resilient means normally supporting said plate in horizontal position to receive the upper divisional portions of stacks and said resilient means permitting a downward movement of the plate to effect delivery of the upper divisional portions therefrom onto said first conveyor means.

5. A stack separating machine of the character described comprising a continuously moving horizontal first conveyor means on which stacks of sheets are conveyed into and through the machine, a vertically adjustable conveyor frame supported above and extending along said first conveyor means, a stack separating plate secured to and extending from the forward end of said conveyor frame and positioned thereby in the path of stacks as they are conveyed into the machine, said stack separating plate being substantially the same width as said conveyor frame, a second continuously moving conveyor means supported by said conveyor frame to receive thereonto the upper divisional portions of a stack advanced across said separating plate, a stack lowering means at the discharge end of said conveyor frame for the return of said upper divisional portions of the stacks from said second conveyor means onto said first conveyor means in separated relationship to the lower divisional parts, said stack lowering means comprising a plate movably mounted adjacent the discharge end of said conveyor frame in alignment with the conveyor means mounted in said conveyor frame and extending beyond said frame and over said first conveyor means, a resilient means normally supporting said plate in horizontal position to

receive the upper divisional portions of the stacks directly thereonto and said resilient means permitting a retarded downward movement of the plate to effect delivery of the upper divisional portions therefrom onto said first conveyor means.

6. A stack separating machine of the character described comprising a continuously moving horizontal conveyor belt on which stacks of paper are advanced in succession into the machine, a pressure applying belt mounted in the machine above and spaced from said horizontal conveyor belt and positioned to pressure engage the top of a stack as advanced on said horizontal conveyor belt, a vertically adjustable conveyor frame supported above, extending along and spaced from said horizontal conveyor belt, a second continuously moving conveyor belt mounted in and operable along said conveyor frame and a stack separating plate mounted by and projecting from said conveyor frame, between said pressure applying belt and said horizontal conveyor belt, to engage and horizontally divide the stacks as advanced by said horizontal conveyor belt and effect delivery of the upper horizontal portions of the stacks onto the second conveyor belt mounted in said conveyor frame.

7. A stack separating machine as in claim 6 wherein said pressure applying belt is downwardly inclined whereby increased pressure is applied to the stack as the stack advances beneath said pressure applying belt.

8. The stack separating machine of claim 6 including a main frame structure and means supporting said horizontally moving conveyor belt at a fixed level therein, and paired sets of links with one end of which is pivoted to said conveyor frame and their other end is pivoted to the main frame structure for supporting said conveyor frame at such elevation that the separating plate will divide stacks of different heights in upper and lower divisional parts of the same proportion.

9. The stack separating machine of claim 6 including a stack lowering means at the discharge end of said conveyor frame for the return of the upper divisional portions of the stacks from said second conveyor belt onto said horizontal conveyor belt in separated relationship to the lower divisional parts of the stacks.

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