March 30, 1954 J. ZALKIND 2,673,612

MACHINE FOR SEPARATING MULTIPLE INTERLEAVED FORMS

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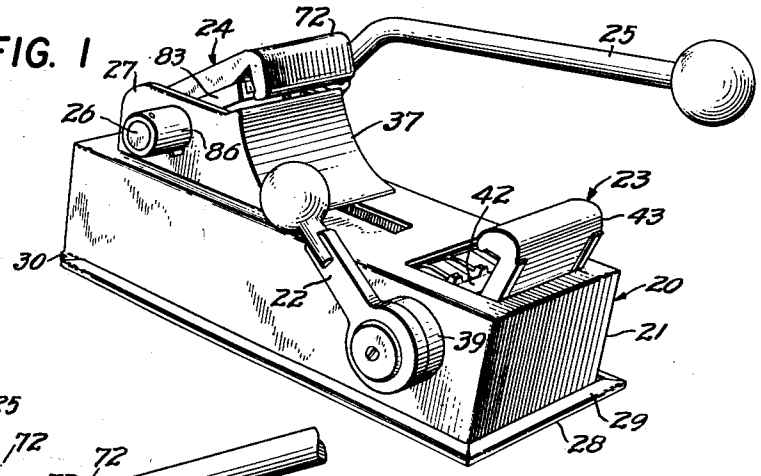
FIG. 1



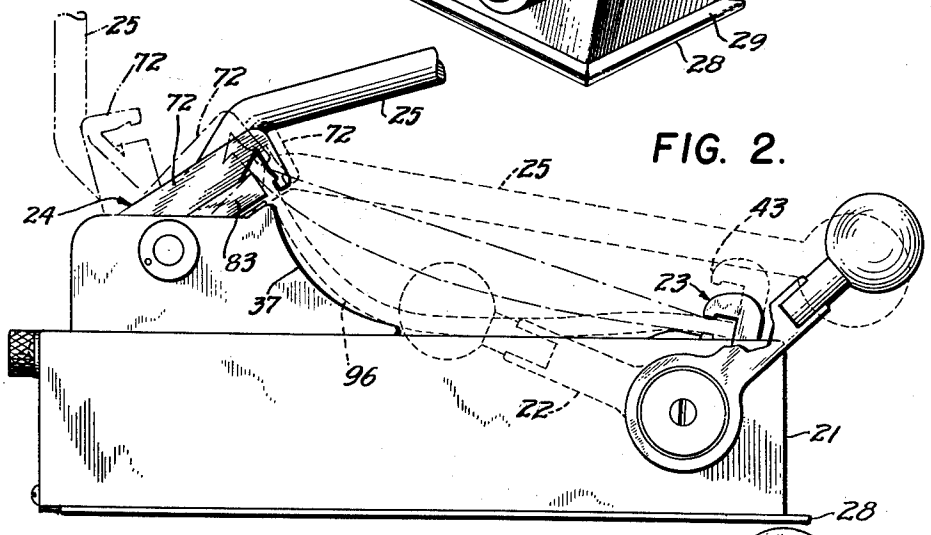


FIG. 2.

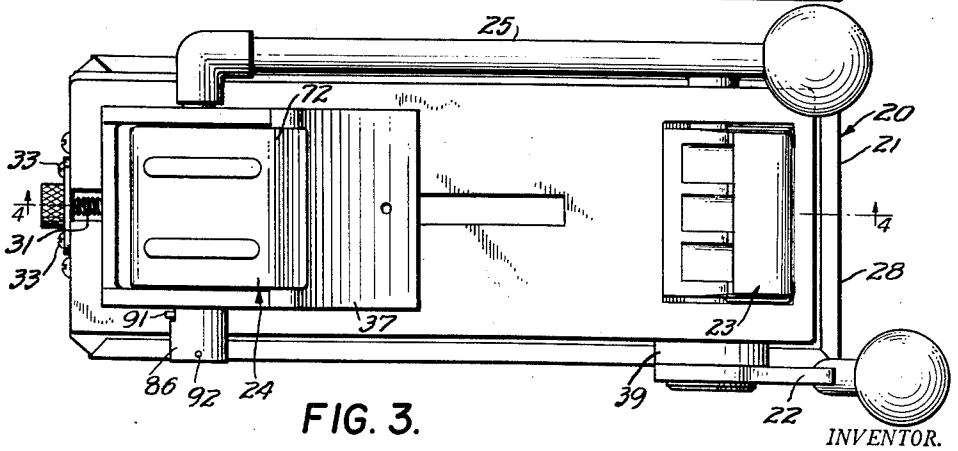


FIG. 3.

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MACHINE FOR SEPARATING MULTIPLE INTERLEAVED FORMS

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FIG. 4.

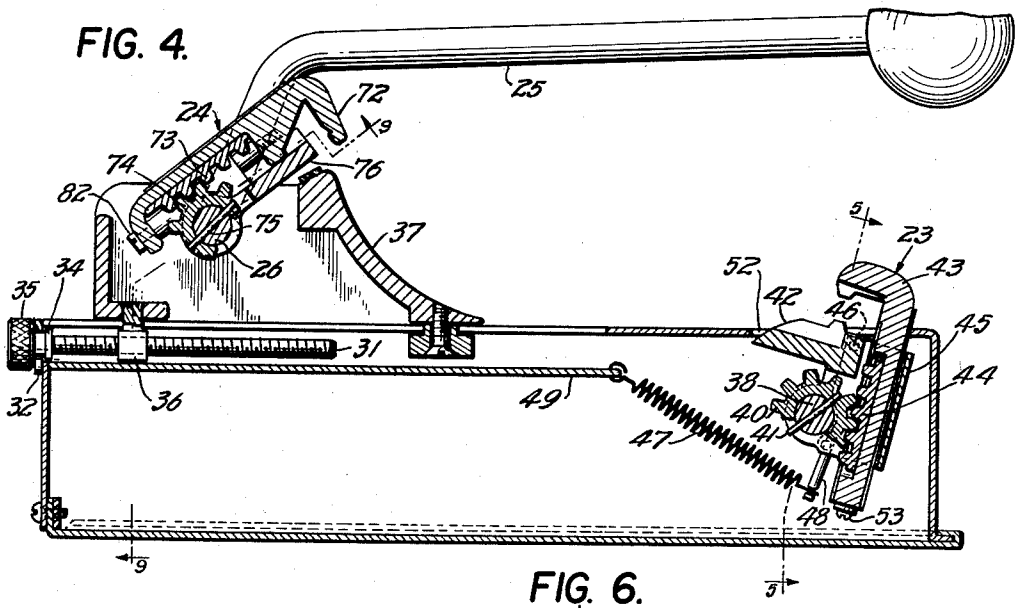


FIG. 5.

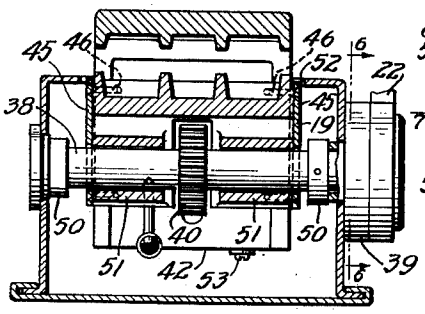


FIG. 6.

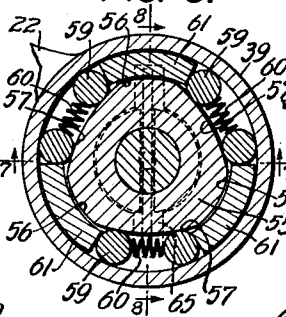


FIG. 8.

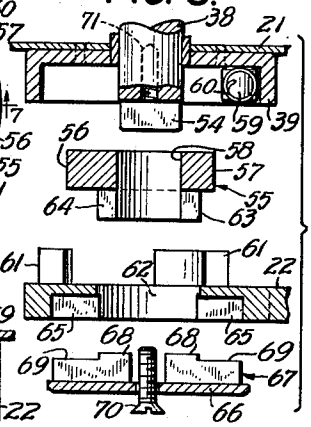


FIG. 7.

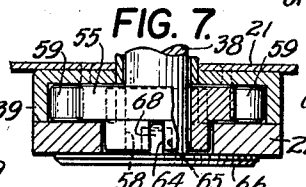


FIG. 9.

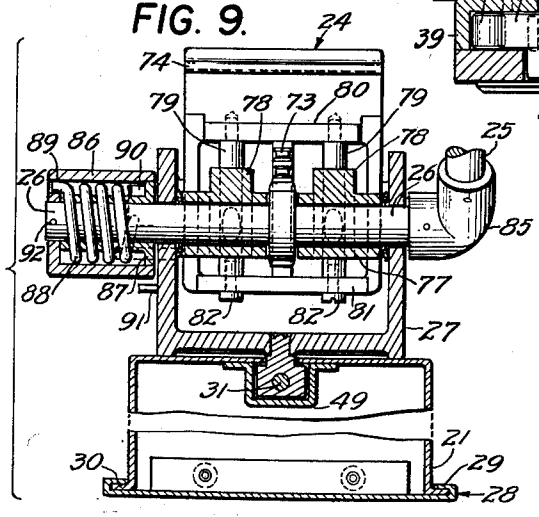
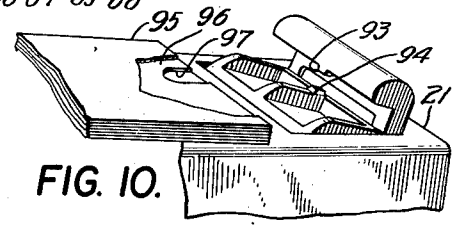


FIG. 10.



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2,673,612

UNITED STATES PATENT OFFICE

2,673,612

MACHINE FOR SEPARATING MULTIPLE INTERLEAVED FORMS

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Application March 15, 1949, Serial No. 81,439

11 Claims. (Cl. 164—84.5)

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This invention pertains to a machine for separating multiple interleaved forms, and relates to the general category of inventions as set forth by the present inventor Joseph Zalkind in his issued United States Patent Number 2,289,161 for a Machine for Tearing Off Bill Folders which was issued July 7, 1942.

The present invention hereinafter set forth in detail is an improvement on said issued patent, but does utilize the function of the interleaved forms being "shingled" and torn apart, which action takes place with the new and novel machine by employing techniques made possible and fully set forth by the inventive concepts presented herein.

Multiple interleaved forms are varied and manifold in their applications. One type, for example uses carbon paper between the printed sheets or forms, and it is desirable to separate the carbon paper from the printed forms, which forms to be separated have weakened portions provided along certain areas. These weakened portions may be prearranged by a series of perforations along the desired areas, such as a line for separation of the forms adjacent one end thereof. Throughout the specification and claims it is to be understood that the expression "weakened" portion or area means any area or demarcation which is adapted to facilitate separation of material or forms by being perforated, scored, precut, or a combination of same, or in any other manner prepared or adapted for facilitating separation of material or forms in prearranged areas.

It is a primary object of the present invention to provide a novel method and apparatus for separating material or forms along certain areas defined by weakened portions, the separating function being brought about by application of strain or tension on opposing sides of the weakened portions of the forms, with the tension applied either gradually or suddenly. The somewhat sudden application of tension may result in a snap action when the forms are properly torn apart or separated.

A further object of the invention is the provision of gripping means for holding the opposing ends of the forms to be separated wherein either one or both of the gripping means or jaws will have an increase in gripping action which is variable with the increase of tension applied to the forms during the separation action.

Another object is to provide a guide for the interleaved forms so that a curved contour may be formed in the stack of interleaved forms prior

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to their being gripped by the gripping means, so that when tension is applied to the forms the strain will be absorbed by the interleaved forms according to their degree of curvature so that a substantially progressive separation of the individual forms will result although the action of separating a stack of forms takes place in a single or unitary motion, or tensioning action.

Still another object is the provision of an automatically operable clutch used in conjunction with the manually positionable jaws of the gripping means for initially securely holding the forms regardless of the thickness of the stack of forms, and with additional rocking means for the jaws to provide an increasing gripping action thereof relatively proportional to the applied tension on the interleaved forms during the separating operation.

Further and other objects of the invention may be and may become apparent to one skilled in the art from a perusal of the following disclosure, and it is intended that the presentation herewith is by way of illustration of one form of a preferred embodiment, and it is not to be considered as a limitation except as defined by the scope of the subjoined claims.

In the drawings:

Fig. 1 is a perspective view of a preferred form of the invention showing the jaws of both gripping means open to receive the interleaved forms to be separated.

Fig. 2 is a side view of Fig. 1 with dotted portions indicated to illustrate the interleaved forms gripped by the jaws, and certain positions of parts to facilitate an explanation of operation.

Fig. 3 is a plan view of the solid line showing of the invention presented in Fig. 2.

Fig. 4 is a sectional view taken substantially along lines 4—4 of Fig. 3 showing the rack and gear arrangement for operating the rocker gripping means, and the adjustable means for accommodation of various sizes of interleaved forms while maintaining the suitable curvature of the forms desirable for proper operation.

Fig. 5 is a partial sectional view taken substantially along lines 5—5 of Fig. 4 showing the set of jaws of the clutch actuated gripping means, with the clutch per se being disposed within the clutch housing.

Fig. 6 is a sectional view taken along lines 6—6 of Fig. 5 showing the relative position of the various components of the clutch.

Fig. 7 is a sectional view partially broken away taken substantially along lines 7—7 of Figure 6 showing the clutch camming members.

Fig. 8 is an exploded view of the clutch showing the clutch housing having the clutch gear shaft disposed therein, the clutch cam, the cam release, and a closure cap all in relative position for assembly.

Fig. 9 is a sectional view taken substantially along lines 9—9 of Fig. 4 showing one of the gripping means with its rack and gear arrangement for operating the jaws thereof, with certain other features for maintaining the jaws in a normally open position, with means to permit sliding of the said jaws and their support on a base member.

Fig. 10 is a modification of the jaws having a single protuberance on opposing jaws for use with certain type interleaved forms.

Referring to the drawings, and more particularly to Figs. 1, 2, 3 and 4, there is shown a multiple interleaved form separator 20 having a supporting structure 21 with a clutch lever 22 for operating the rear gripping means 23. A front gripping means 24 is operated by an operating lever 25 by means of a shaft 26 which is carried on a sliding support 27 which slide is moveable on the upper surface of the supporting structure 21.

A base closure means 28 has channelled edges 29 to permit the base closure to be positioned on the base of the supporting structure 21 by engaging a male flange member 30 which is formed on opposing sides and on one end of the supporting structure 21.

An adjustment screw 31 has a bifurcated plate 32 which is secured to one end of the supporting structure 21 by screws such as 33 and is adapted to fit between a collar 34 and a knurled screw head 35 to retain the screw in a fixed longitudinal position. The threaded portion of the screw fits into a threaded stud 36 which is secured to the lower portion of the sliding support 27 in any convenient manner, but here shown as being staked. An arcuate portion 37 is formed on opposing edges of the sliding support 27 so that the multiple interleaved forms may rest thereon to form a curved contour in said stack of forms so that when said forms are placed in the machine there will be a longitudinal curve in the forms extending normal to the shaft 26 which shaft is parallel to the weakened portions normally provided in the interleaved forms to facilitate separating the forms when tension is applied to the machine during the normal separating operation. The rear gripping means 23 has a shaft 38 which is journalled in opposing sides of the supporting structure with one end of shaft 38 extending through into the clutch housing 39 to be engaged by the clutch lever 22 for operating said shaft 38. A gear 40 is pinned to the shaft 38 by a pin 41.

The rear gripping means 23 has a lower jaw 42 which is freely pivoted on the shaft 38. The upper jaw 43 has a rack 44 secured thereon for engagement with the gear 40. A bracket 45 fits around the rear of the upper jaw 43 and has side portions 19 connected to the lower jaw 42 by pins 46 to hold the rack of the upper jaw 43 in engagement with the gear 40 on the shaft 38. It will be seen that the rear gripping means 23, which consists of the lower jaw 42 and the upper jaw 43, is freely moveable on the shaft 38. A spring 47 has one end thereof connected to a pin 48 which is secured in the lower portion of the lower jaw 42, while the opposite end of the spring 47 is connected to a bracket 49 which is secured to the supporting structure 21. The

purpose of the spring 47 is to maintain the rear gripping means 23 in a normally rearward or full clockwise position.

It will be seen, therefore, that when the clutch is holding the shaft 38 in its fixed position the gear 40 will also be held stationary. However, the rear gripping means 23 is free to rotate or rock about the shaft 38 with the rack 44 in engagement with the gear 40. Consequently, the rocking of the rear gripping means 23 in a counterclockwise direction as seen in Fig. 4 would cause the upper jaw 43 to be drawn toward the lower jaw 42. This action takes place in normal operation of the device and is the secondary tightening function of the rear gripping means 23. The clutch action which will be explained in detail later, takes place when the cltuch lever 22 is not being moved since the clutch action is automatic to prevent the shaft 38 and its gear 40 from rotating at all times except when there is actually taking place a manual movement of the lever 22.

Referring more particularly to Figs. 5, 6, 7 and 8, the clutch has a housing 39 which is actually a cylindrical drum secured to the supporting structure 21 so that the clutch housing 39 is at all times stationary. The shaft 38 has collars 50 which are pinned to the shaft 38 to align the gear 40 with the rack 44. Bearings 51 are formed on the lower portion of the lower jaw 42 to permit a rocking action of the rear gripping means 23 about the shaft 38. The rear gripping means 23 is aligned in the slot formed by guide portions 52 so that the rear gripping means 23 and its rack 44 are at all times properly aligned with the gear 40. A stop 53 consisting of a screw which is threadedly connected in the lower edge of the upper jaw 43 has a washer held by the screw to engage the lower portion of the bearings 51 to act as a limiting means for determining the extent of opening movement of the rear gripping means 23. One end of the shaft 38 extends laterally through the supporting structure 21 and into the clutch housing 39 and terminates with a transverse slot 54 thereacross. The cam 55 has three high portions 56 and three low portions 57. The cam has a central aperture 58 which fits over the end of the shaft 38 and into the recess of the clutch housing 39. Roller bearings such as 59 are all identical and a pair of each of said roller bearings is placed adjacent each of the low portions 57 of the cam 55. An expansion spring 60 is placed intermediate each of the said pair of roller bearings causing said roller bearings to be urged outwardly from the spring 60 so that each roller bearing engages the clutch housing 39 and the low portion 57 of the cam. The high portions 56 of the cam are so shaped as to prevent the roller bearings from moving beyond a predetermined point in the direction caused by the expansion of the spring 60. The clutch lever 22 has three arcuate sectors 61 disposed equi-distant from one another on the interior surface of the clutch lever 22. The three arcuate sectors 61 are designed to fit in between the high portions 56 of the cam 55 and the interior surface of the clutch housing 39. An aperture 62 formed in the clutch lever 22 is adapted to fit about the shoulder 63 formed on one surface of the cam 55. A slot 64 is formed on opposing sides of the shoulder 63. When the cam 55 is placed over the slotted end of the shaft 38 with the slot 54 of the shaft 38 aligned with the slot 64 of the cam 55, the clutch lever 22 may be positioned with its three arcuate sectors

61 each between a pair of roller bearings as shown in Fig. 6. A pair of diagonally disposed slots 65 are formed in the outer surface of the clutch lever 22 with the width of the slots 65 being somewhat wider than the slots 54 and 64 formed in the shaft 38 and the cam 55 respectively. A cover plate 66 has a key portion 67 formed in opposing relation so that the extended portions 68 will fit into the slots 64 and 54 when said slots are aligned, thereby keying the shaft 38 to the cam 55. The lower portions 69 of the key portion 67 are adapted to engage the slots 65 formed in the outer surface of the clutch lever 22. When the cover plate 66 is properly inserted so that the key portion 67 is properly aligned, a screw 70 is threadedly connected to the complementary screw portion 71 to hold the cover plate 66 in position and retain the cam 55 and the clutch lever 22 in proper relation with the clutch housing 39. When the clutch lever 22 is in normal position as shown in Fig. 6, it will be seen that the roller bearings 59 are forcibly urged under action of the spring 60 between the low portions 57 of the cam 55 and the inner surface of the clutch housing 39 as previously explained.

In operation, when the clutch lever 22 is rotated in a counterclockwise direction (Fig. 6), the leading surface of each of the sectors 61 will engage the roller bearing contiguous therewith, thereby permitting the clutch to become unlocked due to the pressure of each particular sector 61 against its respective roller bearing. The remaining roller bearing in each of the spaces between the adjacent sectors has no function in the counterclockwise rotation of the clutch lever 22. As soon as the manual movement of the clutch lever 22 ceases, the various springs 60 will again urge both roller bearings of each pair into interlocking position to lock the cam in fixed relation to the clutch housing 39. When clockwise rotation of the clutch lever 22 takes place, the action is just the opposite.

It will therefore be seen that the slots 65 in the outer surface of the clutch lever 22 are of sufficient width to permit the clutch lever 22 to move sufficiently to unlock the clutching action between the cam 55 and the clutch housing 39. Since the shaft 38 and the cam 55 are keyed to each other it will be seen that any movement in either direction of the clutch lever 22 will unlock the clutch, thereby permitting simultaneous rotation of the cam 55 and the shaft 38. Consequently, the rotation of the shaft 38 will cause rotation of the gear 40 and the ultimate movement of the upper jaw 43 in relation to the lower jaw 42. From the foregoing, it will be seen that either clockwise or counterclockwise motion of the clutch lever 22 will cause either an opening or a closing of the jaws of the rear gripping means 23. As soon as the clutch lever 22 is released so that it is not in motion, the clutch action will hold the jaws in whatever position they are placed by previous movement of the clutch lever 22.

If a stack of interleaved forms are placed between the jaws 42 and 43, and the clutch lever 22 is moved clockwise (see Fig. 2) to rotate the shaft 38 and its gear 40 the stack of interleaved forms will be gripped. However, it is pointed out that the mere rotation of the clutch lever 22 to lightly compress the stack of interleaved forms is sufficient for the purpose intended since an additional gripping action is provided as soon as tension is applied to the opposite end of the stack of interleaved forms. This is possible since the

clutching action holds the gear 40 stationary. However, the rear gripping means 23 is free to rock about the shaft 38 since the rack 44 is in engagement with the gear 40 during the rocking action which takes place when tension is placed on the opposite ends of the stack of interleaved forms. This rocking action which will cause the rear gripping means 23 to move to the left, as seen in Fig. 4, will cause the rack 44 to draw downwardly about the gear 40, thereby causing an increase in gripping action between the jaws 42 and 43.

The front gripping means 24 has a front upper jaw 72 with a rack 73 thereon which engages a gear sector 74, which gear sector is secured to the shaft 26 by means of a pin 75. The front lower jaw 76 which may be clearly seen in relation to Figs. 4 and 9, has journals 77 with bosses 78 on the upper portion thereof as seen in Fig. 9. Sleeves 79 are inserted through complementary apertures in the bosses 78 and engage the upper bar 80 and the lower bar 81. Screws 82 are inserted through said sleeves 79 and are threadedly connected to the upper bars 80, thereby holding the front upper jaw 76 and the front lower jaw 83 in moveable relation. Operating lever 25 is coupled by an elbow 85 to the shaft 26, which shaft is securely connected by pin 75 (Fig. 4) to the gear sector 74. It will be seen, therefore, that rotation of the shaft 26 will ordinarily cause the front upper jaw 72 and the front lower jaw 76 to have relative motion therebetween.

The end of the shaft 26 opposite to the end connected to the elbow 85 has a sleeve 86 spaced at one end from said shaft 26 by a collar 87. The space between collar 87 and the sleeve 86 permits a spring 88 to be inserted therebetween with one end of the spring being secured in a hole 89 with the opposite end of the spring extending through the slot 90 formed in the sleeve 86 with the last said end of the spring 88 engageable with a stop 91 which stop is secured to the sliding support 27. The sleeve 86 is secured in a fixed position to the shaft 26 by means of a pin 92.

When the operating lever 25 is in its forward position, as shown in Fig. 4, the jaws of the front gripping means 24 will be open. As the operating lever 25 is moved in a counterclockwise direction, as seen in Fig. 4, the rack and gear function will cause the jaws of the front gripping means 24 to close, and continued pressure in a counterclockwise direction of the operating lever 25 will cause an increase in the gripping action of said jaws. When the operating lever 25 reaches its rearward position as indicated by the dot-dot-dash lines of the operating lever 25 in Fig. 2, the end of the spring 88 which extends through the slot 90 will engage the stop 91 and cause a tension on the spring 88. As soon as pressure is released from the operating lever 25 shown in the dot-dot-dash portion of Fig. 2, the action of spring 88 will cause a counterclockwise rotation of the shaft 26, thereby causing the front upper jaw 72 to move away from the front lower jaw 76 thereby releasing the gripping action of the interleaved forms when between the jaws.

Fig. 10 shows a modification of the gripping jaws shown in Fig. 5. In Fig. 10 there are shown upper and lower protuberances 93 and 94 respectively, which protuberances are substantially in the center of said upper and lower jaws. This modification is in contradistinction to the upper and lower jaws shown in Fig. 5, wherein there are four upper protuberances spaced from one another across the width of the jaw with com-

plementary protuberances on the lower jaw. The stack of forms 95 shows one representative sheet 96 having a slot 97 therein. One or more of the sheets 96 may have similar slots 97. However, the upper sheet of the stack shown in Fig. 10 would extend to cover the slot 97. If such a stack of forms were inserted between the jaws shown in Fig. 10, with the apertures such as 97 aligned between the jaw protuberances 93 and 94, only the sheets which did not have an aperture such as 97 would be gripped by the jaws while the remaining sheets would remain free to be withdrawn from the stack of forms during the separating operation. While the gripping action between the jaws shown in Fig. 10 may be considered as a single point contact therebetween, this has an additional function in the separating of the individual forms when used in the machine presented herewith, since the major portion of the stress would be in the center of the weakened portion of the forms if the end of the forms with the weakened portion were inserted in the jaws as shown in Fig. 10. This action provided by the jaws shown in Fig. 10 would start to separate the forms where they were gripped between protuberances 93 and 94, and would tear outwardly along the weakened portion of the forms. However, with the multiple protuberances as presented in Fig. 5, there would be an identical action as that for the modification shown in Fig. 10 for each of the set of protuberances. There would be a tendency for the weakened portion to be strained in each place where the interleaved forms are gripped by the protuberances shown in Fig. 5.

It is further pointed out that while protuberances are shown in various forms herein, it is to be understood that no protuberances at all may be desirable in some instances, or protuberances may be used in one set of jaws while a modification or no protuberances at all may be used in the opposing set of jaws.

The method of operation will be described primarily in conjunction with Fig. 2, wherein a stack of interleaved forms 96 shown by two dotted lines representing the upper and the lower sheets of a stack of interleaved forms is resting on the arcuate portion 37 which forms the curvature in the interleaved forms as shown. The stack of interleaved forms 96, in the dotted position, is shown with one end gripped between the jaws of the rear gripping means 23, with the opposite end of said stack of forms being gripped between the jaws of the front gripping means 24. In the solid line showing of Fig. 2, the front and rear gripping means are positioned with the clutch lever 22 in its full clockwise operated position for the particular stack of interleaved forms shown, while the operating lever 25 is shown in a position slightly operated in a counterclockwise direction so that the jaw 72 shown by dotted lines has been moved from said dotted line position to the position shown in solid lines, which was brought about by moving the operating lever 25 from its position shown in dotted lines to its position shown in solid lines. In the solid line position, both the rear and front gripping means 23 and 24 respectively are shown gripping the stack of interleaved forms 96 without the application of any longitudinal stretching or tensioning of said forms. The rear gripping means 23 having had its upper jaw 43 moved from the position shown in dotted lines to its position shown in solid lines was caused by movement of the clutch lever 22 shown in its dotted position to the position of the clutch lever 22 shown in solid lines. The interleaved forms 96, showing their upper and lower sheets represented by dash-dot lines, indicate that tension has been applied to the operating lever 25 in a counterclockwise direction so that the operating lever 25 would be in a slightly higher position than that shown in solid lines, wherein movement of the front upper jaw 72 shown in dash-dot lines has tensioned the forms shown in dash-dot lines so that the upper sheet of the stack of interleaved forms is taut, but before any tearing operation begins, while the lower sheet of the stack of interleaved forms shown in dash-dot lines has a decided curvature.

When the forms held by the front gripping means 24 are said to be "shingled," the successive edges of the multiple interleaved forms are progressively staggered while substantially parallel to the axis extending across the width of the jaws. For clarification, we might say that the edges are in the same plane as the axis of the shaft 26.

When the operating lever 25 is moved in a counterclockwise direction to that shown by the dash-dot-dot lines, the front gripping means 24 will also be moved to the position shown by the dash-dot-dot lines. When the front gripping means is moved to this position last described, sufficient tension will already have been applied to the operating lever 25 so that the multiple interleaved forms will have been progressively separated, substantially one at a time, throughout the entire stack of forms until all of the interleaved forms have been separated. If only a slight gripping action of one end of the stack of interleaved forms was obtained, depending on the counterclockwise pressure applied to the clutch lever 22, a rocking action of the rear gripping means 23 would occur in a counterclockwise direction as an increase in tension was applied to the operating lever 25 in a counterclockwise direction only after the interleaved forms were drawn to a substantially taut position such as indicated by the top sheet shown in dash-dot lines. It will also be seen that since the front gripping means 24 rocks on its shaft 26, an increase in counterclockwise tension on the operating lever 25 would also cause a simultaneous increase in the gripping tension of the jaws of the front gripping means 24.

What is claimed as new and desired to be secured by Letters Patent of the United States is:

1. A device for separating multiple interleaved forms having weakened transverse portions in predetermined areas to facilitate separating said interleaved forms in said predetermined areas upon application of sufficient tension applied to opposing ends of said interleaved forms, comprising a pair of spacially positioned rocker gripping means for gripping the opposed ends of said interleaved forms, means positioned intermediate said pair of spacially positioned rocker gripping means adapted to form a curved contour in the interleaved forms normal to said weakened transverse portions to provide staggered parallel edges of the interleaved forms at one end thereof, means for independently operating each of said gripping means to grip opposing ends of the interleaved forms while in said curved contour position, means for applying tension to said interleaved forms for substantially progressively separating the multiple interleaved forms in the order of their degree of curvature, at least one of said gripping means being movable to selec-

tively vary the distance between said gripping means, said curvature forming means being integrally movable therewith.

2. A device for separating multiple interleaved forms having weakened transverse portions in predetermined areas to facilitate separating said interleaved forms in said predetermined areas upon application of sufficient tension applied to opposing ends of said interleaved forms, comprising a pair of spacially positioned rocker gripping means for gripping the opposed ends of said interleaved forms, means positioned intermediate said pair of spacially positioned rocker gripping means adapted to form a curved contour in the interleaved forms normal to said weakened transverse portions to provide staggered parallel edges of the interleaved forms at one end thereof, separate means for operating each of said gripping means to grip the opposite ends of said interleaved forms while in said curved contour position, clutch means for automatically initially locking one of said gripping means, means for manually positioning said clutch actuated gripping means, means for permitting an increase in gripping action of the clutch actuated gripping means under influence of tension applied to the interleaved forms gripped by said clutch actuated gripping means, and means for applying tension to said interleaved forms by a rocking action of the other of said gripping means.

3. A device for separating multiple interleaved forms having weakened transverse portions in predetermined areas to facilitate separating said interleaved forms in said predetermined areas upon application of sufficient tension applied to opposing ends of said interleaved forms, comprising a pair of spacially positioned rocker gripping means for gripping the opposed ends of said interleaved forms, means positioned intermediate said pair of spacially positioned rocker gripping means adapted to form a curved contour in the interleaved forms normal to said weakened transverse portions to provide staggered parallel edges of the interleaved forms at one end thereof, separate means for operating each of said gripping means to grip the opposite ends of said interleaved forms while in said curved contour position, clutch means for automatically initially locking one of said gripping means, means for manually positioning said clutch actuated gripping means, means for permitting an increase in gripping action of the clutch actuated gripping means under influence of tension applied to the interleaved forms gripped by said clutch actuated gripping means, means for applying tension to said interleaved forms by a rocking action of the other of said gripping means, and means for simultaneously positioning said means for forming said curved contour and said other of said gripping means.

4. A device of the class described comprising a pair of jaws for gripping a margin of a stack of forms, a second pair of jaws for gripping an opposed margin of said stack, one of said pairs comprising means mounting said pair for reciprocal rectilinear motion of the jaws thereof with respect to each other, said one pair being rotatably mounted on a rotatable shaft, means for oscillating said shaft, means for biasing said one pair of jaws to retard bodily rotation of said jaws upon initial rotation of said shaft, means mounted on said shaft engaging at least one jaw of said pair whereby rotary movement of said shaft will draw said jaws together to clamp the adjacent margin of said stack and through said engagement bodily rotate said one pair of jaws to apply tension to said stack of forms.

5. A device as set forth in claim 4, wherein the means mounted on said shaft engaging at least one jaw comprises a pinion, said one jaw having a rack engageable by said pinion.

6. A device as set forth in claim 4, including guide means on said shaft, a jaw of said one pair being supported for reciprocal motion by said guide means.

7. A device as set forth in claim 6, the other jaw of said one pair being restricted to rotary motion with respect to said shaft.

8. A device of the class described comprising a pair of jaws for gripping a margin of a stack of forms and having means mounting said pair for reciprocal rectilinear motion of the jaws thereof with respect to each other, said pair being rotatably mounted on a rotatable shaft, means for oscillating said shaft, means for biasing said pair of jaws to retard bodily rotation of said jaws upon initial rotation of said shaft, means mounted on said shaft engaging at least one jaw of said pair whereby rotary movement of said shaft will draw said jaws together to clamp the margin of said stack and through said engagement bodily rotate said pair of jaws to apply tension to said stack of forms.

9. A device as set forth in claim 8, wherein the means mounted on said shaft engaging at least one jaw comprises a pinion, said one jaw having a rack engagable by said pinion.

10. A device as set forth in claim 8, including guide means on said shaft, a jaw of said pair being supported for reciprocal motion by said guide means.

11. A device as set forth in claim 10, the other jaw of said pair being restricted to rotary motion with respect to said shaft.

JOSEPH ZALKIND.

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