

**Aug. 27, 1963**

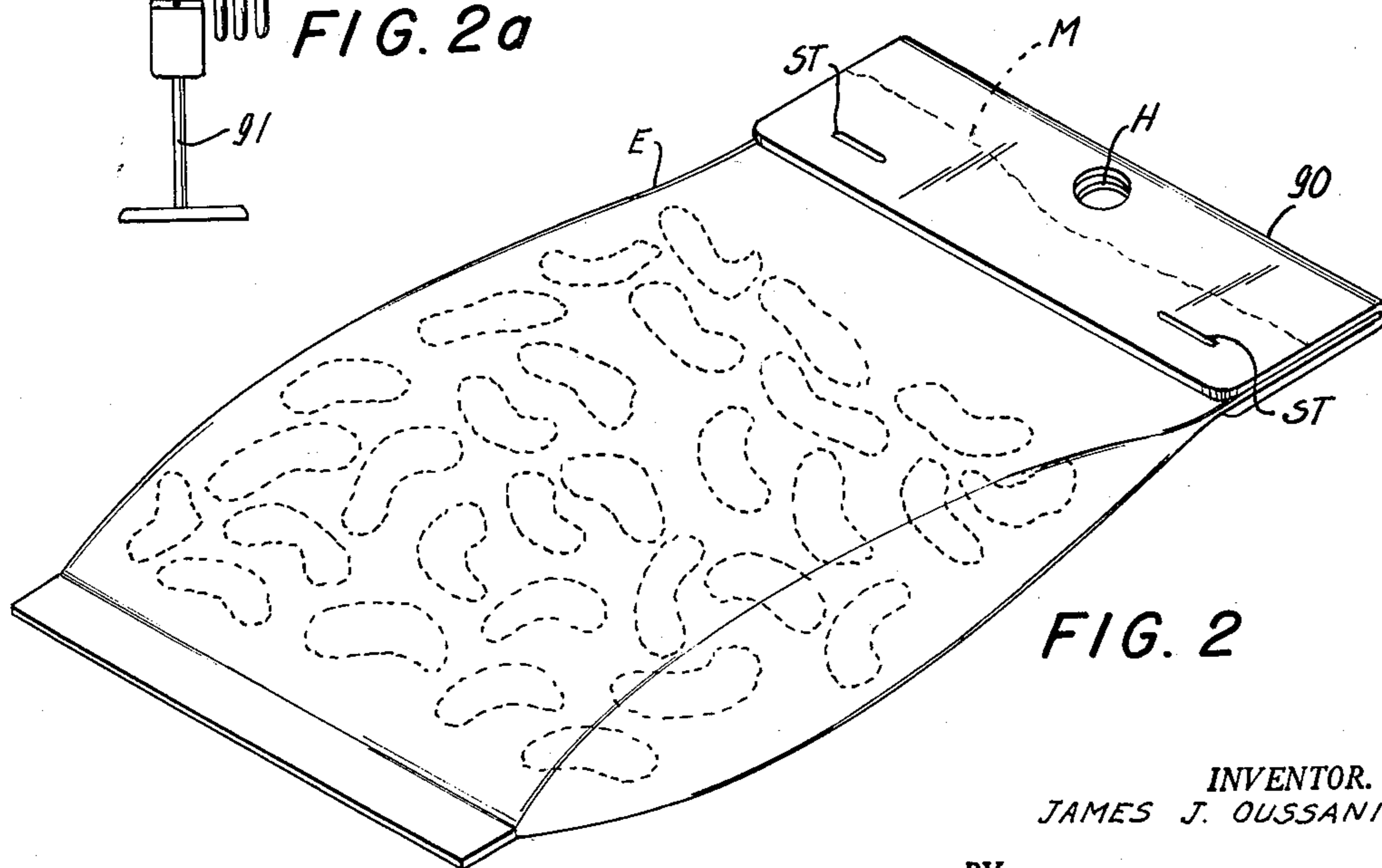
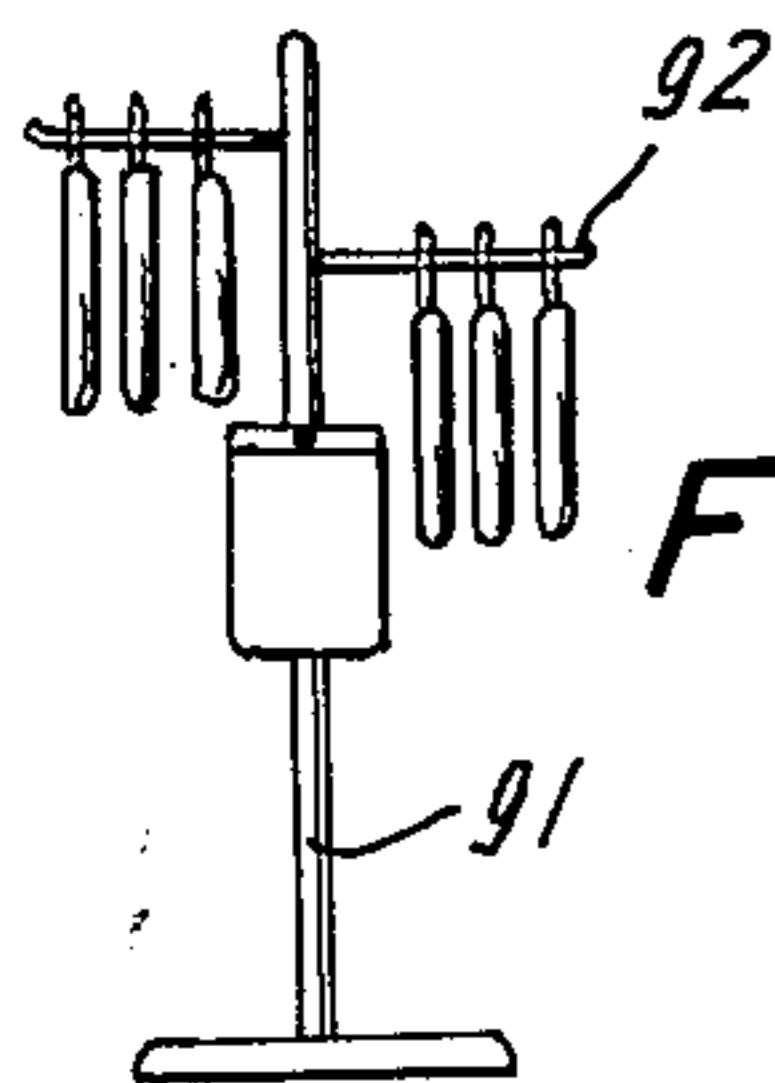
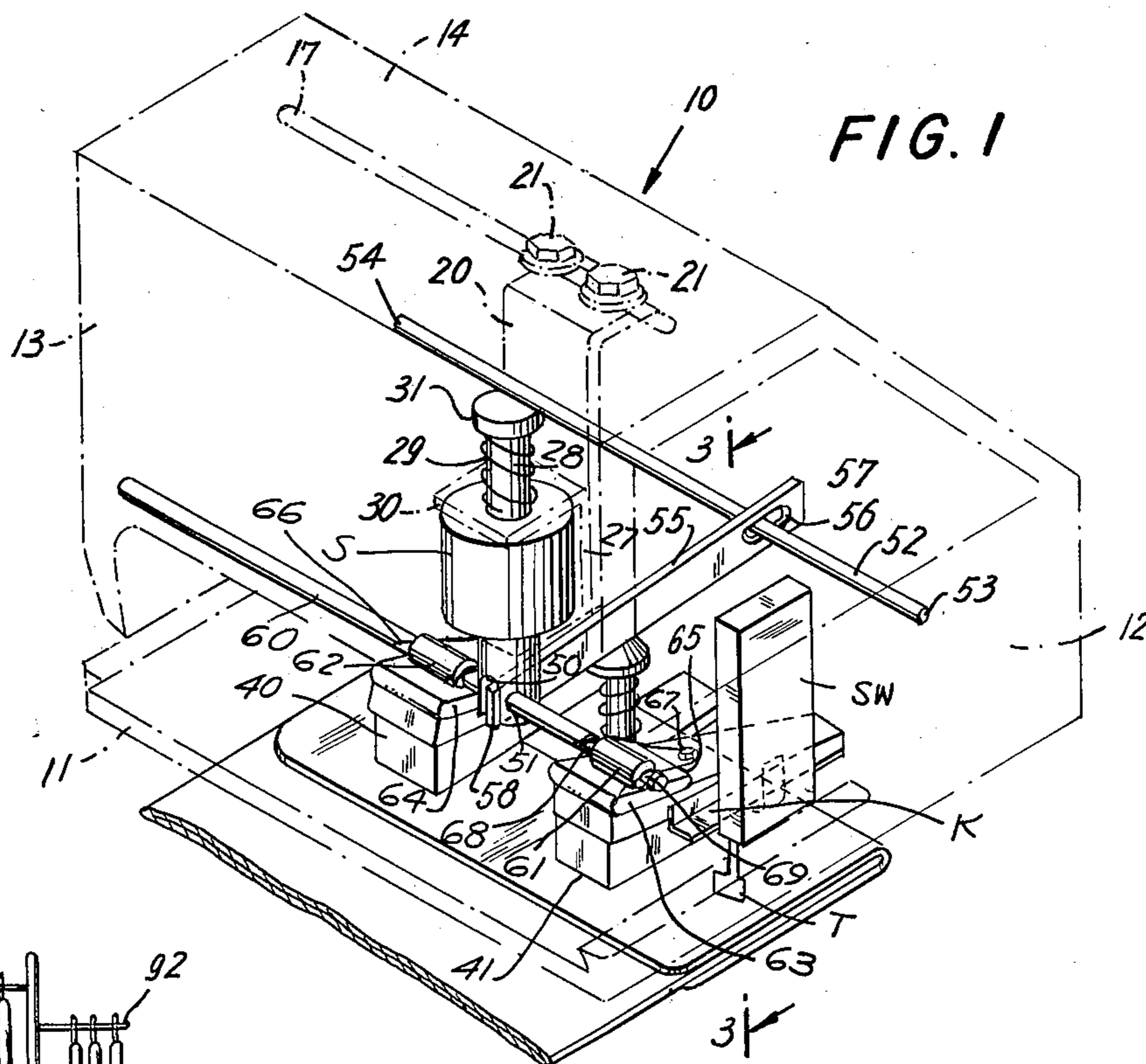
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**3,101,478**

MULTIPLE FASTENER DEVICE

Filed Aug. 2, 1961

2 Sheets-Sheet 1



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2 Sheets-Sheet 2

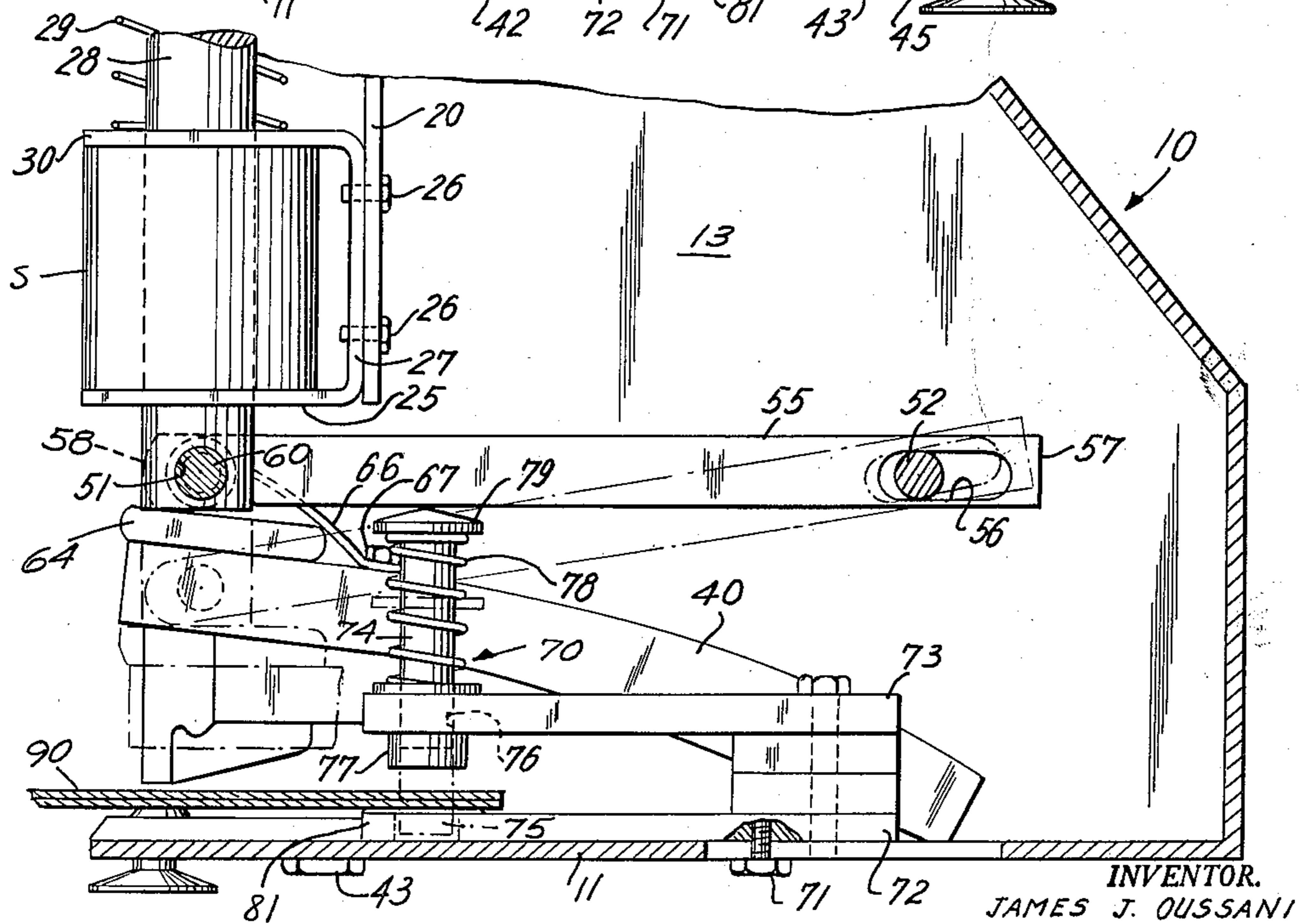
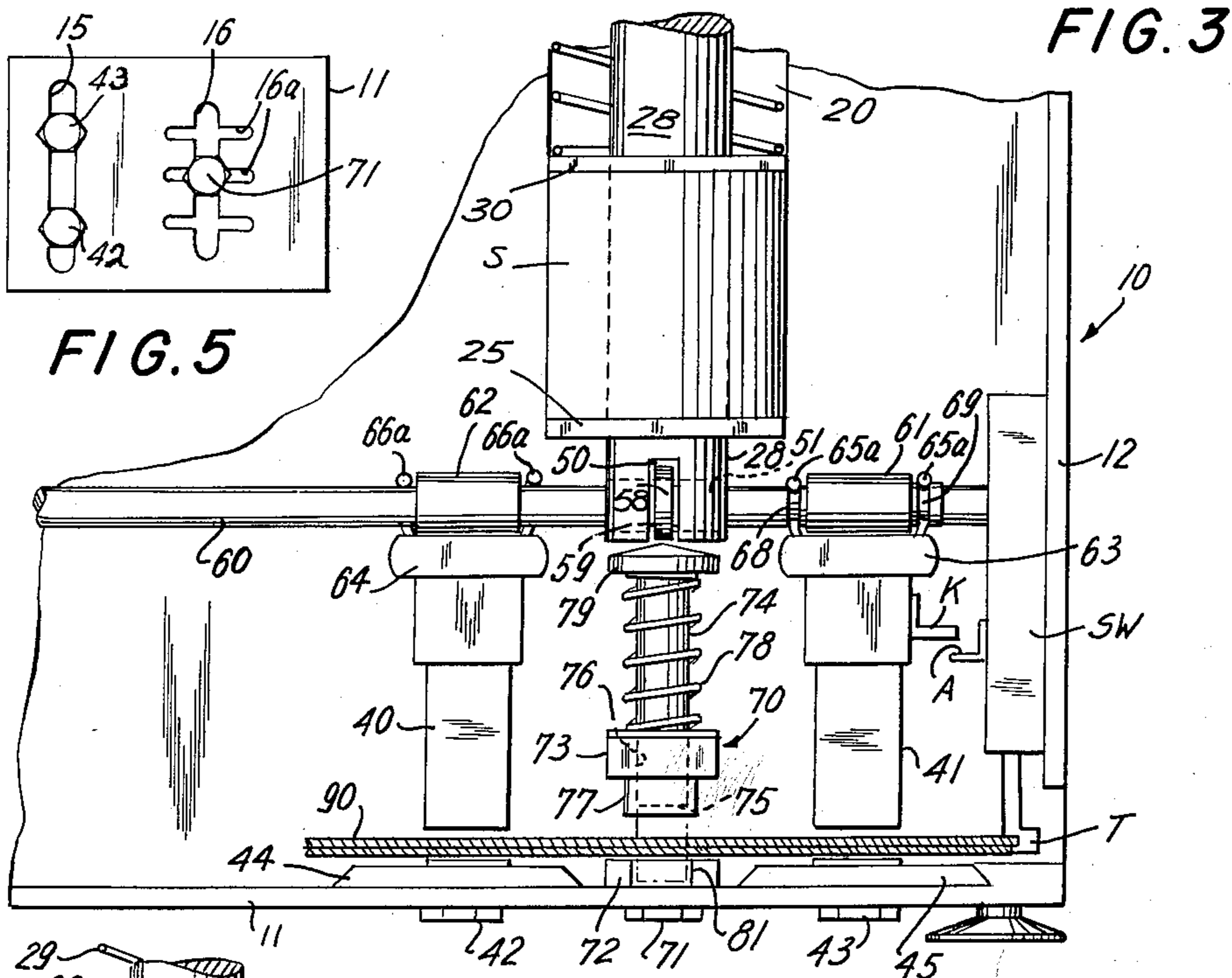


FIG. 4

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3,101,478

## MULTIPLE FASTENER DEVICE

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4 Claims. (Cl. 1-120)

This invention relates to a combined fastener and punch driving apparatus, and more particularly to a powerized package forming apparatus.

Still more particularly, this invention relates to a device for sealing open mouthed envelopes or the like, particularly intended for use in conjunction with or to be sold from advertising display stands or the like.

The form of package which this invention is specifically designed to create consists generally of an elongated envelope, normally of cellophane, glassine or like transparent plastic material. After filling with the material to be merchandized, a relatively heavy, generally rectangular member, normally of cardboard, is folded medially and placed over the open mouthed end of the envelope, the medial fold line aforesaid normally lying adjacent the open mouthed portion of the envelope. The package is completed by driving two or more staples through the double layer of cardboard and by punching or otherwise forming a hole through the cardboard flap. The package may then be displayed on a display stand having horizontally disposed hooks, which hooks pass through the aperture formed in the flap, to form an attractive mode of displaying the product, and one from which the packages may conveniently be removed for purchase.

While the primary utility envisioned for the hereinafter described fastener and punch device lies in the formation of packages of the type heretofore described, it will be readily understood by those skilled in the art, that other analogous and non-analogous uses for the same may be found.

In essence, the invention relates to a novel punch and stapler combination whereby the operative elements may be adjusted relatively to each other to provide for the utmost flexibility to permit packages of a wide variety of sizes to be formed with great accuracy and in a single finishing operation.

This invention is a continuation-in-part of my copending application Serial No. 56,391, filed September 16, 1960 and entitled Multiple Stapler, now Patent No. 3,016,538, dated Jan. 16, 1962.

In its more particular aspects, this invention relates to a powerized multiple stapler assembly having a novel means for driving staples at adjustable, spaced points responsive to the insertion of the article to be stapled, substantially as described in my aforesaid copending application. The improvement herein comprises essentially novel means for actuating a punch assembly in coordinated relation to the multiple stapler assembly of my prior application. Accordingly, it is an object of my invention to provide an improved fastening device. A further object of this invention is to provide a powerized, multiple stapler and punch device of novel construction whereby the operative components may be adjusted one with respect to the other to provide a high degree of flexibility and to permit a wide variety of stapling and punching operations, and particularly to facilitate the manufacture of envelope-type packages as previously described.

Still a further object of this invention is to provide a powerized fastener and punch device having novel power distributing linkage means whereby in all adjusted positions of the operating components, the punch device is arranged to receive increased driving pressure, automatically to provide for the increased pressure required to operate the punch as compared with the stapler device.

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To attain these objects and such further objects as may appear herein or be hereinafter pointed out, reference is made to the accompanying drawings, forming a part hereof, in which—

FIGURE 1 is an isometric view of the stapler and punch device, partly in phantom;

FIGURE 2 is a perspective view of a package formed by the powerized stapler and punch device of the invention;

FIGURE 2a is an end elevational view of a display stand on which packages, as illustrated in FIGURE 2, have been arranged in a normal display position;

FIGURE 3 is a fragmentary front elevational view, with parts broken away to show details of construction;

FIGURE 4 is a fragmentary side elevational view, with parts of the housing being broken away to show details of construction;

FIGURE 5 is a bottom view from the base of the stapler device, showing the limits of adjustability of the elements supported thereon.

In accordance with the invention, there is provided a housing 10 including a base 11, side walls 12 and 13 and top wall 14. As best seen in FIGURE 5, the base 11 is provided with a lateral slot 15 and a second lateral slot 16, spaced rearwardly therefrom, the slot 16 being provided with longitudinally directed and intersecting cross slots 16a forming with the slot 16 what may be described as a grid.

The top wall 14 is provided with a lateral slot 17 extending over the major portion of the top wall 14 between side walls 12 and 13. An L-shaped bracket 20 is adjustably secured on the inner face of top wall 14 by bolts 21, 21, which pass through the slot 17 and are threaded into apertures suitably formed and threaded upon the bracket 20. A solenoid impeller S which is mounted in yoke or bracket 25 is secured to the bracket 20 by bolts 26, 26 passing through bracket 20 and threadedly secured to central branch 27 of U-shaped yoke 25. An armature 28 is slidably and reciprocally mounted in the solenoid S, said armature or plunger 28 being maintained in the normally raised position by coil spring 29, the lower end of which bears against leg 30 of yoke 25 and the upper end of which is compressed against plunger head member 31—see FIGURE 1—secured to the top of the plunger 28.

Stapler members 40, 41, which may be of any known, standard stapler construction, are secured to the base 11 by means of bolts 42, 43, respectively, passing upwardly through the slot 15 and threaded into complementary apertures formed in the base portions 44, 45, respectively, of the staplers 40, 41.

In the illustrated embodiment, the stapler 41 has been secured adjacent wall 12 in order that elements mounted on said stapler may be utilized in deactivating the solenoid S after the stapling stroke has been completed, as more fully hereinafter set forth.

The lowermost end of the plunger 28 is provided with a longitudinally directed slot 50 and a cross bore 51 which lies normal to and intersects the slot 50. A support rod 52 is horizontally secured within the housing, the opposed ends 53, 54 of said rod being secured to side walls 12, 13, respectively. The driver lever 55, constituting a relatively heavy and rigid bar, is provided with an elongated slot portion 56 adjacent the rearward end 57 thereof. The rod 52, before mounting, has been threaded through the slot 56, thereby linking the lever 55 to the rod 52 in a manner to permit pivotal, longitudinal, and lateral sliding movement of the bar 55 with respect to the rod 52.

The forward end 58 of the bar 55 is provided with a transverse aperture 59 which is aligned in registry with the cross aperture 51 of the plunger 28.

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A cross bar 60, in the form of a cylindrical rod, is threaded through aperture 51 of the plunger and aperture 59 of the driver lever 55, thus maintaining the end 58 of the lever 55 within the slot 50 of the plunger 28.

A pair of rollers 61, 62 are rotatably mounted on cross bar 61 to overlies the driver or actuator pad portions 63, 64 of staplers 41 and 40, respectively. Rollers 61 and 62 are maintained in alignment with the pads 63, 64, respectively, by hairpin spring members 65, 66, respectively, which are generally U-shaped in configuration, the back or central portion of the springs 65, 66 being secured to the staplers, as by sheet metal screws as shown at 67—see FIGURES 1 and 4.

The leg portions 65a, 66a of springs 65 and 66 are biased against the upper portions of the cross bar 60 surrounding rollers 61, 62, respectively, the above described arrangement serving to bias roller 62 against pad 64 and roller 61 against pad 63. The cross bar 60 may be formed with annular grooves 68, 69 where lateral adjustability of the stapler with respect to the base is not desired.

As shown in FIGURE 3, leg portions 65a of spring 65 are seated in grooves 68 and 69, whereby lateral adjustment of the stapler 41 is restricted unless the portions 65a are removed from the aforesaid annular grooves 68, 69.

The punch member 70 is adjustably secured to the base 11 by means of bolts 71 passing upwardly through the grid portion comprising slots 16 and 16a and threaded into a complementary aperture formed in the base portion 72 of the punch 70. Any of a number of known punch forms may be utilized, the illustrated embodiment 70 comprising a fixed support arm 73 secured in parallel spaced relation to the base 72 of the punch. A plunger 74 having a lower cutter edge 75 is reciprocally mounted for axial movement in an aperture 76 formed in arm 73 and boss 77. A coil compression spring 78 is biased between arm 73 and the underside of punch head 79 to maintain the punch in the upward position, as shown in FIGURES 1, 3 and 4 in solid lines.

For operation, the staplers 40, 41 may be separated the desired distance by releasing nut 42 and shifting stapler 40 laterally within the confines of slot 15, thereafter tightening the nut 42 when the stapler is positioned as desired. Desirably the punch 70 is disposed centrally between the staplers 40 and 41, the latter adjustment being effected by loosening nut 71 and shifting the punch 70 as desired. The grid slotted arrangement as shown at 16 and 16a permits a range of lateral as well as longitudinal adjustments of the punch 70. After the punch 70 is adjusted, bracket 20 must be complementally adjusted by loosening bolts 21, 21 and by shifting the bracket within the confines of slot 17 in a manner to align drive lever 55 with the head 79 of the punch 70, whereby the head 79 is preferably forced upwardly by the spring 78 in direct contact with the lever 55, which construction results in a reduction of noise over that which would be present if the punch head were spaced from the underside of the driver lever. The punch 70 is provided with the usual female die or anvil 81 in the base 72 thereof, the lowermost portion of the said die preferably opening to one of the grids or slots 16, 16a, so as to provide an exit for punched out cardboard disks.

The solenoid S is connected to a suitable source of power, with switching means SW being interposed in the circuit to said source of power. Any of a variety of switching devices may be employed for this purpose, the operation of such devices being well known to those skilled in the art. In the present device, the switching means SW is closed to energize solenoid S by the insertion of an article against the trigger portion T. The switch is opened when abutment A of the switch is depressed by kick-off bar K made fast to the driver arm of stapler 41, it being understood that the parts K and A are coordinated in order not to effect the deenergization of solenoid S until the staple

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driving and hole punching strokes of the staplers and punch, respectively, have been completed.

As shown in FIGURE 2, an envelope E of cellophane or the like has had its open mouth portion M closed by means of a folded cardboard flap 90. A pair of staples ST have been driven through both leaves of the flap 90, sandwiching therebetween the mouth portion M of the envelope E. In the embodiment of FIGURE 2, a hole H has been punched in the flap at a point above the mouth portion M. As shown in FIGURE 2a, a stand 91 having extending hooks 92 forms a support for the envelopes E, the latter being secured to the hooks 92 by threading the same through the holes H of the envelopes.

In operation, when the solenoid S is energized, the cross bar 60 acting through rollers 62 and 61, drives the staplers 40, 41 downwardly through a staple driving stroke. Simultaneously, the downwardly pivoting driver lever 55 contacts the head 79 of punch 70, causing cutter 75 to be directed through the flap 90 and into the die portion 81 formed in the base 72 of the punch.

As best seen by comparing the solid line and dot and dash views of FIGURE 4, the bar 55 moves not only pivotally but also longitudinally forwardly with respect to the support rod 52 during a driving cycle. By positioning the head 79 of the punch 70 intermediate the ends of driver lever 55, a mechanical advantage is obtained whereby the punch 79 is driven with increased pressure as compared with the pressure applied to the staplers 40 and 41. The throw of the staplers and punch is coordinated whereby the punching operation is completed prior to or contemporaneously with the clinching of the staples.

While my device has been described primarily in connection with its use as a flap applying and punching device for packaging, it will be readily understood that many other uses for the device exist. One such suggested use is as a booklet forming fastener for forming a plurality of papers into a pamphlet, and at the same time punching holes in the formed pamphlet to enable the same to be received in a loose leaf binder or the like.

Likewise, while my device has been illustrated in conjunction with two stapling units and one punching unit disposed therebetween, it will be understood that three or more staplers may be employed and two or more punches may be employed, to provide any desired combination of punching and stapling operations. Where the device is used for the flap portion, as previously described, extremely accurate operations are possible for the application of a variety of sizes of flaps. In each instance the location of the staples and hole may be controlled within a close degree of tolerance by adjustment of the components.

It should be borne in mind in the formation of envelope packages for display, that the hole H is desirably located as nearly exactly in the lateral center of the flap as possible, so that the package when hung on the hook as illustrated in FIGURE 2a will hang vertically rather than at a tilt, as would be the case in any inaccurately positioned hole.

Having thus described the invention and illustrated its use, what is claimed as new and desired to be secured by Letters Patent is—

1. A powerized stapler and punch device comprising a housing having a base portion, a plurality of stapler members mounted side by side on said base portion, at least one said stapler member being laterally adjustably mounted relative to the other said member, an electrical impeller member mounted on said housing having a depending, vertically shiftable plunger, a laterally extending cross bar carried by said plunger operably connected to said stapler members, a laterally disposed support rod having its ends fixed to the side walls of said housing, to be in parallel spaced relation to said cross bar, a driver lever pivotally secured at one end to said plunger and having at its other end a longitudinal slot portion within which said support rod is slidably and pivotally received,

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and an independent punch device longitudinally and laterally adjustably secured to said base, said punch including a driver head portion disposed beneath and in contact with said driver lever at a point intermediate the ends thereof.

2. A powerized stapler and punch device comprising a housing having a base portion, a plurality of stapler members mounted side by side on said base portion, at least one said stapler member being laterally, adjustably mounted relative to the other said member, an electrical impeller member laterally adjustably mounted on said housing and having a depending plunger arranged to shift downwardly upon energizing of said impeller, a horizontal cross bar slidably secured in a laterally directed aperture formed in said plunger, said cross bar being in operable connection with and of a length to overlie said stapler members in all adjusted positions thereof, a horizontally disposed support rod having its end portions secured to the side walls of said housing, a drive lever having one end slidably mounted on said cross bar and having a longitudinal slot portion at its other end slidably mounted over said rod, and an independent punch device adjustably secured to said base and including a driver head disposed beneath said driver lever at a point intermediate the ends thereof.

3. A powerized stapler and punch device comprising a housing having a base portion, a plurality of stapler members secured to said base portion in side by side relation, an impeller member mounted for lateral adjustment on said housing and including a downwardly shiftable plunger, a laterally extending cross bar carried by said plunger, said cross bar being of a length to overlie and be operably associated with said stapler members in all

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adjusted positions thereof, said bar being adapted, upon actuation of said impeller, to urge said stapler members through a staple driving stroke, a longitudinally extending driver lever having at one end an aperture within which said cross bar is slidably and pivotally received, a horizontally disposed support rod having its opposed ends secured to the side walls of said housing, a slot portion formed at the other end of said driver lever, said support rod being fed through said slot to provide a pivotal and longitudinal and sliding connection between said lever and rod whereby said lever may be moved in a direction normal to the axis of said rod, and an independent punch device adjustably secured to said base and between said stapler members, the punch device including a head portion disposed beneath said lever whereby, upon activation of said impeller, said punch is driven through an operative stroke.

4. A device in accordance with claim 3 wherein said lever and head are coordinated to drive said punch device through an operative cycle in advance of completion of the driving cycle of said stapler members.

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