July 15, 1947. L. G. FREEMAN, JR 2,424,023

DECORATING MACHINE

Filed Feb. 17, 1944 2 Sheets-Sheet 1

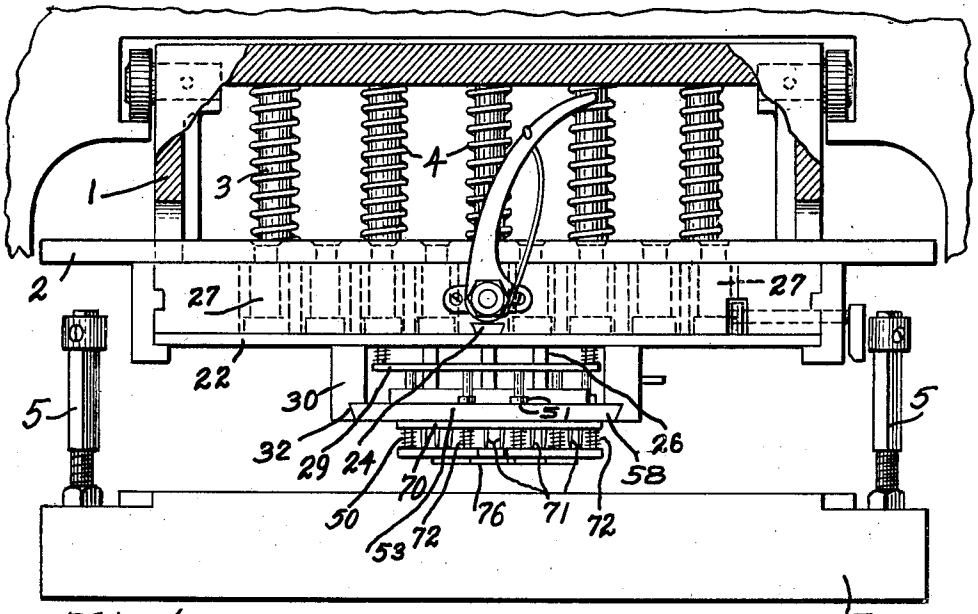


Fig. 1.

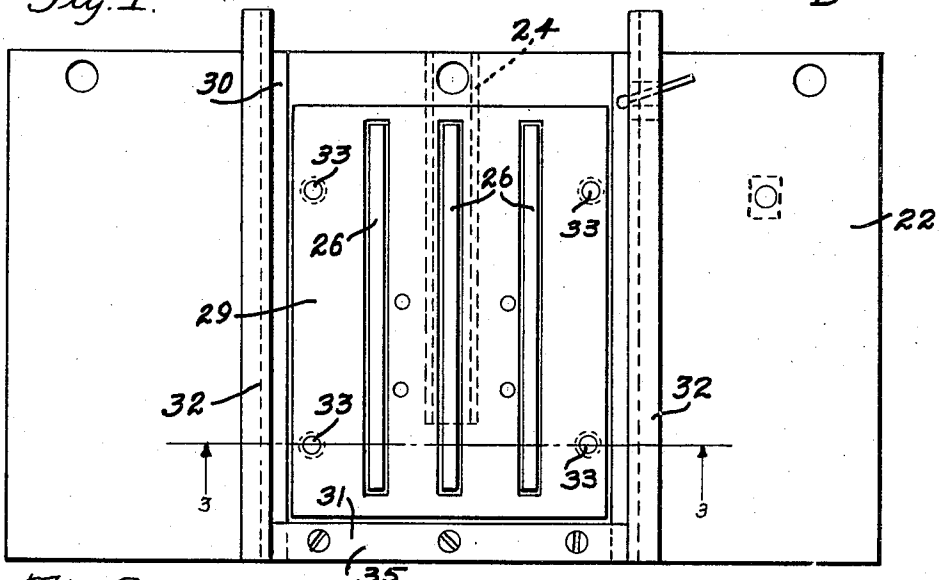


Fig. 2.

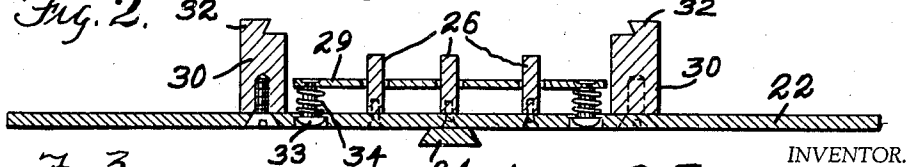


Fig. 3.

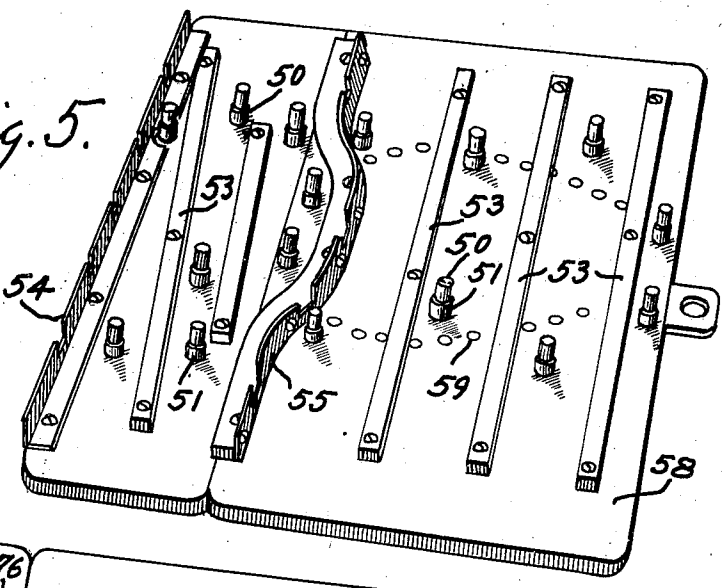
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Fig. 5.



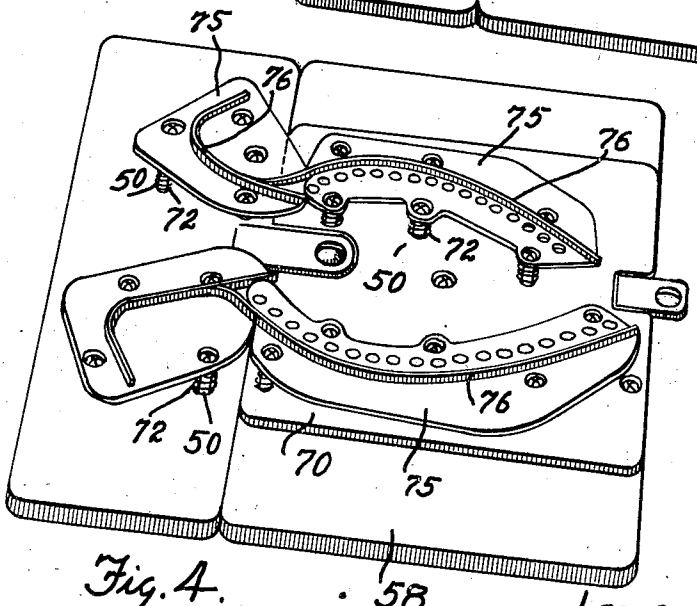


Fig. 4.

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Patented July 15, 1947

2,424,023

UNITED STATES PATENT OFFICE

2,424,023

DECORATING MACHINE

Louis G. Freeman, Jr., Cincinnati, Ohio

Application February 17, 1944, Serial No. 522,813

15 Claims. (Cl. 101—30)

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This invention relates to shoe machinery and more particularly to improvements in dies for use in ornamenting shoe uppers and shoe parts by the formation of cutouts and perforations and portions thereof and also by the application of printed markings.

The illustrated embodiment of the invention is a type of die adapted for operations upon skins, upper blanks, fitted or closed uppers and the like, in which the work is marked with ink or pigment at the same time, or as a part of the cycle of operations, during which the work is also ornamented by the perforating or cutting-out of a design or ornamental opening therein. The markings applied to the work may take the form of permanent ornamentation such as simulated stitching, or patterns may consist of guide lines to aid in subsequent operations upon the work, e. g., to indicate the location for a line of stitching, or to assist in the fitting together of several shoe parts. Preferably, the marking and perforating or cutting will be performed in a single machine operation.

Specifically, this invention relates to improvements in dies of the general type disclosed in the Louis G. Freeman, Jr., Patent No. 2,183,038, dated December 12, 1939, which dies are especially adaptable for use in the type of machine described and claimed in the Benjamin W. Freeman Patent No. 2,241,393, dated May 28, 1941.

With many types of work, the pressure requirements for ornamenting and for stripping the work from the cutting elements of the die are very heavy, and machines referred to in said applications are particularly designed to meet such requirements, particularly with relation to the stripping of the work from the die.

Conventional strippers include some mechanism directly associated with the die unit, such as a stripper plate mounted on springs, which serve normally to maintain the stripping plate in a position slightly in advance of the cutting edges of the die, and to restore the plate to such position during the stripping operation. The spring pressure must be so adjusted as to accommodate varying thicknesses of leather or material upon which the die is working, and difficulties may arise in this connection, especially when marking edges are placed upon the stripper; thus, if the spring pressure is adjusted to mark and properly strip a light piece of calfskin, the marking edges would probably injure a thicker or heavier piece of leather. Obviously, when the material is thick, the stripper will be depressed more by the material than would be the case by thin leather.

Varying pressures are required with different characters of leather, as well as with different thicknesses. As the number of cutouts or perforations in a piece of work is increased, the need

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for greater pressure likewise increases, and such pressures are very difficult of attainment, if not impossible, with conventional stripping devices now in use.

In the solution of these problems, the machine and dies of the present application contemplate a stripping mechanism wherein the pressure is applied by means independent of the die, or by means independent of any arrangement for applying a light printing or marking pressure to the marking elements.

As illustrated in the machine of the aforesaid Benjamin W. Freeman patent, the pressure for stripping purposes is obtained by building a pressure applying mechanism for stripping purposes in the machine, as distinguished from supplying each individual die with a self-contained complete stripping mechanism. The usual stripper plate mounted in advance of the cutting edges may be retained on the die, and this plate may be provided with marking edges thereon, or a stripping medium separate from the die may be provided and marking means independent thereof supplied. In fact, the die may incorporate separate stripping and marking media, all mounted in the same die unit.

The primary object of the present invention is the provision of the die with a structural design to cooperate with a pressure applying mechanism built into the machine, and a stripper plate yieldably mounted for normal location in advance of the cutting edges of the die, but with a mounting of such a nature that little or no pressure will be exerted on the plate, and hence, on the work until the main stripping pressure is applied.

The object of the present invention is the provision also of a structural design which provides for the use of all the advantages of the stripping mechanism built into the machine and dies of lighter construction. The present invention eliminates the need of building a complete die unit comprising base plate, supports, subplate, tube plate, stripper posts and stripper built as a complete unit fastened into the machine by the usual method, by providing a master die holder which comprises a base plate, rigid supports running in a direction from the front of the die holder to the rear, and a yieldably mounted plate attached to posts which go through the base plate and contact the stripper applying means in the machine. This master die holder is a complete unit, and is fitted with dovetail ribs on each side to receive a die unit made merely of the subplate and posts which contact the yieldably mounted plate in the master holder when the die unit is in place in the master holder. The other ends of the stripper posts are fastened to the stripper or marking plate, whichever the case may be. The advantage of this arrangement is the fact that

when purchasing dies it is only necessary to purchase the small die unit comprising the subplate, tube plate and stripper plate, the subplate preferably being fitted with the rigid supports running the opposite direction from the subplate supports on the master die holder. The unit also would contain the stripping posts attached at one end to the stripper, running through the tube and subplate and ending at the same height in the back as the height of the rigid supports. Good support will be had from such an arrangement because wherever the supports in the die unit contact the supports in the master die holder, a solid support will be effected at that point. The reason for running the supports in the die unit in another direction is so that any type of design can be used in this master arrangement. If the supports were all in the master die holder and the subplate of the die unit laid against these supports, the designs in many instances would come in a position over the supports which would block up the clearance hole in the subplate for the outlet of the cuttings of the die design. By running the ribs in the opposite direction on the die unit in comparison to the direction that the ribs run in the master die holder in building a die, the supports on the die unit can be so placed and cleared that openings are provided for the cuttings in each die design. Another advantage of this type of die is the ease with which it can be taken apart and leveled. The ends of the subplate, which are parallel to the sides of the machine, are angular and fit in the dovetail ribs in the master die holder, which means that the subplate can be ground to the desired height and without any other fitting, will slide right into the die holder. Another advantage is the smaller amount of space such dies would take up in a shoe factory. Also, the lighter amount of weight for an operator on these machines to handle in placing and replacing dies in her machine makes this arrangement advantageous. Great saving of material would also be effected as well as a much lighter die to ship.

All the stripping features in the regular die of this type are used to the fullest in this die.

Referring to the drawings:

Figure 1 is a front elevation of the machine showing the parts in idle position.

Figure 2 is a bottom plan view of the master die holder.

Figure 3 is a section on line 3—3 of Figure 2, showing the base plate structure.

Figure 4 is a perspective view of one form of die plate and attachments, same being taken with the plate inverted from the normal working position in a machine of the type to which I have applied my invention for purposes of illustration thereof.

Figure 5 is a perspective view of the reverse of the device shown in Figure 4.

Referring first to the carriage, it contains the elements shown and described in my Patent No. 2,183,038 consisting of a die carriage 1 which slides in and out of the machine, a laterally projecting plate 2 which slides in the die carriage up and down, a series of supporting posts 3 with respect to which the plate 2 is also slidable, around which posts are heavy springs 4. The sides of the work support are equipped with adjustable posts 5 which lie in a path which will result in their contact with the projecting sliding plate 2, so that as the die carriage 1 and the work support approach each other, the rails will push upwardly, the plate 2 compressing the springs 4. The under side of the plate 2 is equipped with posts 27 which pass through the under face of the die carriage 1. There they contact the supports of the floating stripping pressure plate to be described below. This device, therefore, functions to cause the floating stripper pressure plate to rise and descend with the plate 2, and hence, to apply a spring actuated downward pressure only when the work support starts moving downwardly at the completion of a work decorating stroke.

The under side of the die carriage is equipped with a master die holding plate or base plate 22, which is held to the base of the die carriage by suitable means. The plate is one which will accommodate a wide variety of die units proper, but the preferable practice is to provide several of these master plates for the dies which will be very wide and those which will be narrower. It may have a dovetail gib 24 for guiding it into position when initially mounting it, in the same manner as the die unts are mounted on the carriage in my former patent above referred to, so that machines equipped as for use according to my former patent may be provided with the master die holding plate or base plate without change of the die carriage.

This base plate has lateral bars 30 on which the die unit is secured, said bars equipped with dovetail slides 32 for that purpose. At the rear, these two lateral bars are connected and braced by a rear support bar 31. Also projecting downwardly from the base plate is a series of supporting bars 26 which extend in one direction, preferably parallel with each other. As the description proceeds, it will be noted that these bars contact like bars on the die unit proper, which extend in a transverse direction to the bars 26.

Also in connection with the master die holder base plate, there is provided the floating stripping pressure plate 29, already referred to above, which plate has slots therein to accommodate the supporting bars 26.

The floating stripper is mounted on headed studs 33 around which may be light springs 34, which have no function but to keep the plate normally advanced and prevent it from becoming cocked. The plate is so proportioned that these studs 33 come, when the plate is in position, to a location below the posts 27 to the end that the posts will actuate the plate in accordance with the mode of operation in the said Patent No. 2,183,038.

The equipment so far described is placed in the machine and remains there, ready for reception of the die units which are arranged to fit within the dovetail slides, and so as to come up against the stop bar 35 located on the rear support bar 31 when in accurate home position. Other locating means may be provided for the die unit in the master base plate, as will be understood without further illustration, which means will be known by the manufacturer, and hence provided on each die unit as sold.

The work support, which is raised and lowered to operate on the work, is generally indicated at B and will be provided with means for mounting of a gauge plate (not shown) which will be arranged to go with whatever die is to be used, a gauge plate being provided normally with each die or set of dies for a given piece of work.

The die unit is supplied with a die base plate 58, arranged for mounting in the guides on the master base plate. The upper surface of the die base plate 58 is equipped with supporting ribs

53, which are extended transversely of the supporting ribs on the master base plate and generally conformed to the requirements of clearance of the stripper plate posts to be described below. Guards 54, 55 may be provided in connection with the ribs, which guards are angle strips of metal slotted for clearance of the master base plate supporting ribs 26.

This plate has clearance holes 59 for the chips removed by cutting operations, and holes for passage of the stripper plate posts. In the illustrated form, the plate is in two sections, which will often be desirable to permit providing one standard decoration with graded subdecorations for different sizes or styles, based on the standard decoration. In such a case, some suitable means of securing the two plates rigidly together is provided, which is not an essential of my present invention.

The working face of the die unit consists of a cutter mounting plate or tube plate 70, which has the desired cutters or cutting tubes secured thereto, the same being indicated at 71. In the illustrated die unit, there is only one main cutter mounting plate, the added section of the die consisting solely of stripper elements. The stripper elements are in the form of plates 75, which have holes to accommodate the cutter tubes, and as shown may be provided with printing or marking ribs 76. These ribs are normally inked in the course of the carriage movement, and when the work piece placed on the gauge plate is brought up against the stripper plates, the first action thereof will be to imprint or mark on the work the design established by the ribs 76.

The stripper plates, whatever their number, are mounted by means of posts 80, which are surrounded by light springs 72 which bear between the stripper plates and the surface of the base plate or cutter plate, as the case may be. Printing pressure of the stripper plates is thus provided for, and as the cutters are forced through the stripper plate holes and the work, the stripper plates will slide up (in this case), the posts being the sliding elements that pass through the die plate.

The posts have collars 81 on their portions lying on the opposite side from the springs now noted, so that the advanced position of the stripper plates with reference to the cutter is maintained by the springs 72, since said collars engage the back of the die plate proper.

The posts are substantially the dimension to bring their free ends to a level so that they contact the floating plate 29 of the main stripper mechanism in the master structure. When the supporting ribs on the die and on the master plate are in contact, and the work support and die have been brought together, and the plate 2 elevated, as it will be incident to operation of the work support and the upper header ends of the studs on the plate 29 are free to rise, the posts on the strippers will rise with but little opposition, and no substantial increase of pressure on the stripper. But as the work support moves down, and the plate 2 is strongly pushed down by its spring 3, then the posts 27, in contact with the studs on the floating plate will push it down positively. This will push down on the posts of the strippers and positively strip the work away from the cutter without compressing the work.

It will now be noted that the advantages set forth in the introductory statement are accomplished by the structure illustrated. As compared to my previous patent above referred to, the problem of supplying adequate stripping pressure is taken care of by means which do not have to be supplied with each die sold, but which are set up in the machine as a master structure.

I have not described portions of my apparatus where not necessary to an understanding of the invention sought to be illustrated, aand specifically do not wish to be limited in the scope of the inventive concept inherent in the disclosure because of the selection of a certain type of machine to which my invention is applied. Thus, the working parts could be inverted, operation could be caused by movement of the die rather than the work support, a different type gauge could be used, and the main stripping pressure need not be in a carriage which moves in and out of the machine. Also, it is not necessary to my invention in its broadest sense to employ the stripper plates as printing elements.

Thus, one modification of the structure shown, which would accomplish some of the advantages thereof, would be to eliminate the demountable nature of the master plate, thus making it a fixed part of the carriage. If this is done, then the supporting posts in the form of headed studs on which the floating plates are suspended could be threaded directly into the posts depending from the sliding plate 2 in the carriage. This structure does not require separate illustration.

Having thus described my invention, what I claim as new and desire to secure by Letters Patent is:

1. In a machine of the character described wherein work holding means and die supporting means are brought together to decorate a piece of work, and in which an actuated element to provide stripping pressure is incorporated with the die supporting means and is moved away from stripping position during work decorating movement, a master die holder comprising a member mountable on the die supporting means, means thereon to demountably arrange a die, and a plate supported movably on the master die holder and having means contacting with the actuated element, the said die mounting means arranged to mount the die in advance of the plate.

2. In a machine of the character described wherein work holding means and die supporting means are brought together to decorate a piece of work, and in which an actuated element to provide stripping pressure is incorporated with the die supporting means and is moved away from stripping position during work decorating movement, a master die holder comprising a member mountable on the die supporting means, means thereon to demountably arrange a die, a plate supported movably on the master die holder and having means contacting with the actuated element, the said die mounting means arranged to mount the die in advance of the plate, and a die arranged to be demountably secured to the master die holder and having work stripping means thereon, the said last named means having members to contact with the movably supported plate.

3. The combination of claim 2 in which the members on the work stripping means consist of posts resiliently urged to work stripping position with relatively light spring pressure.

4. The combination of claim 3 in which the stripping means is provided with print marking ridges to print mark the work as a part of the same operation with cutting it with the die.

5. In a machine of the character described wherein work holding means and die supporting means are brought together to decorate a piece of work, and in which an actuated element to provide stripping pressure is incorporated with the die supporting means and is moved away from stripping position during work decorating movement. a master die holder comprising a member mountable on the die supporting means, means thereon to demountably arrange a die, a plate supported movably on the master die holder and having means contacting with the actuated element, the said die mounting means arranged to mount the die in advance of the plate, die contacting ribs on said master die holder, said movably supported plate being arranged with clearance therefor.

6. In a machine of the character described wherein work holding means and die supporting means are brought together to decorate a piece of work, and in which an actuated element to provide stripping pressure is incorporated with the die supporting means and is moved away from stripping position during work decorating movement, a master die holder comprising a member mountable on the die supporting means, means thereon to demountably arrange a die, a plate supported movably on the master die holder and having means contacting with the actuated element, the said die mounting means arranged to mount the die in advance of the plate, die contacting ribs on said master die holder, said movably supported plate being arranged with clearance therefor, and a die arranged to be demountably secured to the master die holder, and having work stripping means thereon, the said last named means having members to contact with the movably supported plate, said die having stiffening ribs thereon extending in a direction transverse to the ribs on the master die holder, and located so as to contact the latter ribs.

7. The combination of claim 6 in which the members on the work stripping means comprise posts resiliently urged to work stripping position with relatively light spring pressure, whereby the contacting ribs will cooperate without presenting undue problems in arrangement of the location for the said posts.

8. The combination in a press for decorating material with holes and print marks, a carriage, a work support, the carriage movable to and from operative position, and the work support movable to cause an operation upon the work, a master die supporting plate on the carriage having means thereon for supporting demountably a work cutting and marking instrumentality, said marking portion of said instrumentality comprising a plate with marking projections thereon resiliently held on mounting members in advance of the cutting elements of the said instrumentality and a stripping pressure plate mounted on the master die supporting plate and located between it and the die, means whereby said stripping pressure plate moves in a direction to and from the work support as the work support moves to and from the carriage, the members on the marking instrumentality arranged to engage the said stripping plate, whereby the marking instrumentality performs as a stripper for the work on the work holder with no more than its own resilient mounting members except as the carriage and the work support separate from each other after a work decorating operation.

9. The combination in a press for decorating material with holes and print marks, a carriage,

a work support, the carriage movable to and from operative position, and the work support movable to cause an operation upon the work, a master die supporting plate on the carriage having means thereon for supporting demountably a work cutting and marking instrumentality, said marking portion of said instrumentality comprising a plate with marking projections thereon resiliently held on mounting members in advance of the cutting elements of the said instrumentality and a stripping pressure plate mounted on the master die supporting plate and located between it and the die, means whereby said stripping pressure plate moves in a direction to and from the work support as the work support moves to and from the carriage, the members on the marking instrumentality arranged to engage the said stripping plate, whereby the marking instrumentality performs as a stripper for the work on the work holder with no more than its own resilient mounting members except as the carriage and the work support separate from each other after a work decorating operation, said master plate having ribs thereon extending in one direction which have clearance relative to the stripping plate, and the cutting and marking instrumentality having a mounting plate therefor which has ribs thereon arranged to contact the ribs first mentioned but extending transversely thereof.

10. In a cutting and marking machine, the combination of a die support and a work support, a plate located on the die support, means whereby said plate moves in a direction away from the work support as the work support and die support are brought together, and moves in a direction toward the work support when the two are separated, means on the die support for mounting a die thereon in advance of the said plate, a die and a stripper on said die having spring urged supporting posts which engage the said plate, said stripper having marking projections thereon.

11. In a cutting and marking machine, the combination of a die support and a work support, a plate located on the die support, means whereby said plate moves in a direction away from the work support as the work support and die support are brought together, and moves in a direction toward the work support when the two are separated, means on the die support for mounting a die thereon in advance of the said plate, a die and a stripper on said die having spring urged supporting posts which engage the said plate, said stripper having marking projections thereon, ribs extending in one direction on the die support, said ribs passing through the plate, and ribs on the die mounting extending transversely of the ribs on the die support.

12. A die for use with a master die holder having rigid projections thereon in a pre-arranged pattern, said die having a plate portion for mounting on the die holder, said plate portion having rigid projections thereon arranged to contact the projections on the die holder when the plate is in position thereon.

13. The combination of claim 12, in which mounted on said plate is a marking stripper, resiliently held posts for said stripper passing through the plate, said posts arranged to project into a position which does not contact any projection of the die holder when said plate is in position thereon.

14. A die for use with a master die holder having interspaced ribs thereon extending in generally parallel relation, said die having a plate

portion for mounting on the master die holder, ribs on the plate arranged to contact the ribs on the master die holder when the plate is in position on the master die holder, said ribs extending transversely of the ribs of the master die holder.

15. The die of claim 14 on the plate of which is supported a marking stripper for the die, and resilient posts for said stripper extending through the plate, said posts being arranged in position to clear the ribs on the master die holder.

LOUIS G. FREEMAN, JR.

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