July 5, 1927. 1,634,752

W. F. LAUTENSCHLAGER

COMBINATION DIE FOR USE IN PERFORATING MACHINES

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Fig. 1

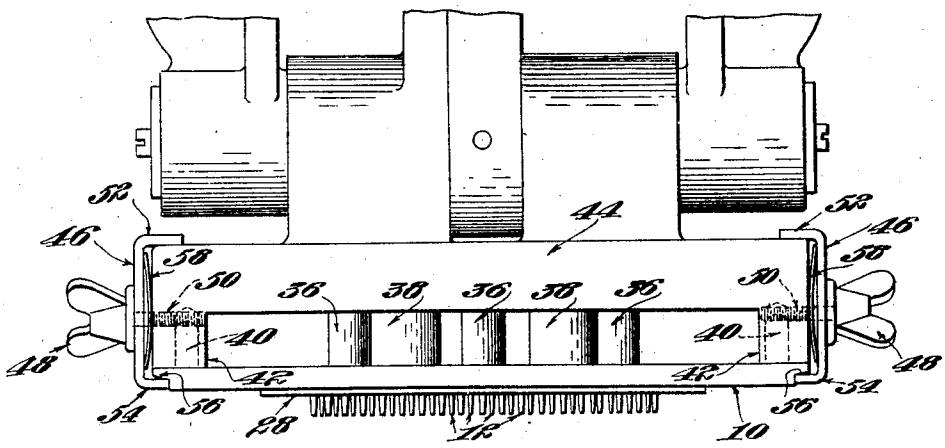
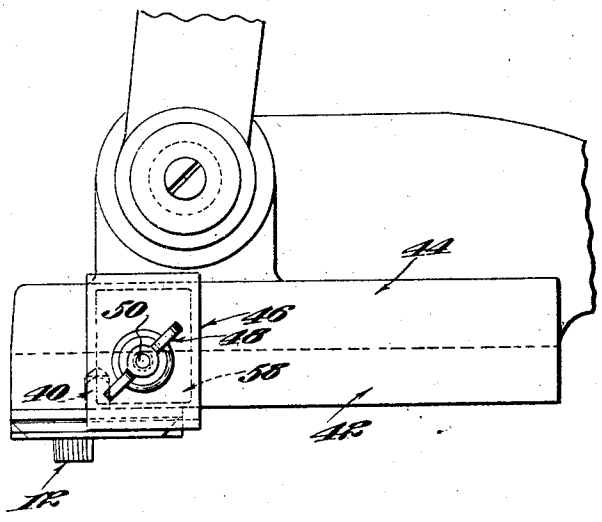


Fig. 2



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Fig. 3

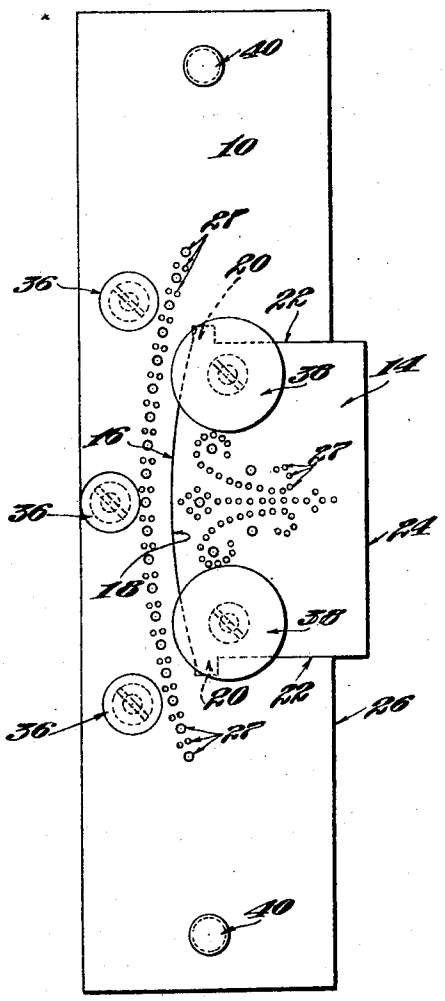


Fig. 4

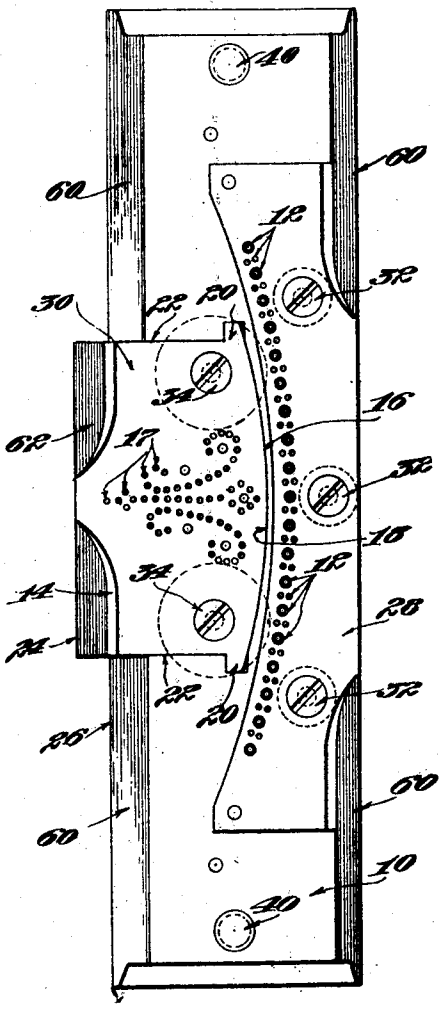
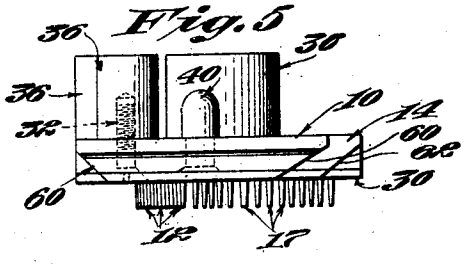


Fig. 5



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UNITED STATES PATENT OFFICE.

WILLIAM F. LAUTENSCHLAGER, OF CINCINNATI, OHIO, ASSIGNOR TO THE PEERLESS MACHINERY COMPANY, OF BOSTON, MASSACHUSETTS, A CORPORATION OF MASSACHUSETTS.

COMBINATION DIE FOR USE IN PERFORATING MACHINES.

Application filed January 17, 1924. Serial No. 686,815.

This invention relates to a combination die and more particularly to such a die adapted for use in perforating machines of the general character shown and described in United States Letters Patent No. 1,434,060, issued to me October 31, 1922.

Machines of this general character are extensively employed in the shoe manufacturing industry for perforating a complete design upon shoe parts on each operation of the machine. For this purpose a tube die is used comprising a plate carrying a multiplicity of tubes of various shapes and sizes set therein and arranged in the form of a design. When, for instance, such dies are used for perforating shoe tips, imitation vamps and similar shoe parts, the tubes are generally arranged to perforate a curved linear design, known as the sweep line, and a centre design inside the curve. Even when of simple design, these dies are expensive to make and when the design is complicated, which is frequently the case, the cost is very large.

The main object of the invention is the provision of a combination die made in a plurality of parts, said parts being so constructed as to be interchangeable with other similar parts carrying different designs to permit of various combination designs at a reduced expense for dies.

Another object of the invention is the provision of a combination die of simple and efficient construction which permits the various parts of the die to be easily and expeditiously interchanged with other similar parts.

A further object is the provision of simple means for locking the parts of the die together to prevent relative movement thereof and for supporting the various parts in position when the dies is used in machines of the Lautenschlager type.

Other object of the invention will be more specifically set forth and described hereinafter.

In the drawings illustrating one embodiment of my invention, Figure 1 is a front elevation of a die constructed in accordance with my invention, mounted and secured upon a die-carrying plunger of the general construction shown in the patent to me hereinbefore referred to; Fig. 2 is a side elevation of the same; Fig. 3 is a plan view of the back or reverse face of the die; Fig. 4 is a plan view of the right face of the die, and Fig. 5 is an end elevation of the die; Figs. 3, 4 and 5, showing the die on an enlarged scale as compared with that in Figs. 1 and 2.

In the drawings my invention is shown as embodied in a two-part die which is adapted for perforating a design on tips, imitation vamps and similar shoe parts comprising a linear or sweep-line design within the curve of which is centrally disposed a center design. The die consists of a main body-portion 10 carrying hollow tubes 12 for perforating the sweep-line design and a center-piece 14 with hollow tubes 17 designed to perforate a center design. The body portion is provided with a suitable recess centrally located in one side to receive the center-piece and thereby to permit center-pieces with various designs to be interchangeably used with body-portions having different sweep-line designs. To bring the design on the center-piece into close proximity to the sweep line design the inner wall 16 of the recess and the corresponding edge 18 of the center-piece may be curved.

Any suitable interlocking means may be provided for locking the center-piece 14 within the recess in the body-portion 10 to prevent relative movement therebetween and one such means consists in providing the center-piece with an ear 20 on each side adapted to fit a similarly shaped sub-recess or indentation in a side wall 22 of the recess. This is merely illustrative, however, since the engaging side walls of the center-piece and body-portion may be variously shaped to accomplish this interlocking result.

The two parts of the die may be variously shaped in outline and their relative widths may vary in different combinations. It is not necessary that the outer edge 24 of the center piece register with the edge 26 of the body-portion since within reasonable limits apparent to one skilled in the art, the center-piece may project from the body portion.

The hollow perforating tubes 12 and 17 may be of ordinary construction set upright in the two parts of the die respectively and extending therethrough to permit the punchings perforated from the work to pass

through the bores 27 of the tubes and out on the back faces of the die-parts. Plates 28 and 30 may be secured to the right faces of the body-portion and center-piece respectively by screws 32 and 34 respectively in order to support the tubes against bending and breaking under the perforating strain.

On their backs or reverse faces the die-parts may be provided with lugs or back-supports 36 and 38 properly placed or located to prevent the parts bending under the perforating pressure since any bending whatever of the die-parts will affect the quality of the work done. These lugs may be fastened in any suitable manner such as by screws threaded through the die-parts. As shown, however, the screws 32 are extended through the body portion and used for securing the lugs 36 in place and the screws 34 are similarly extended through the center piece to serve other lugs 38.

The lugs or back-supports 38 mounted on the center piece also have an additional function. They are made of greater diameter than the lugs on the body-portion and are so located on the center-piece that they overlap the body portion so that when the die is mounted in a perforating machine of the general construction of the patent hereinbefore referred to with the right or tube side downwardly the lugs 38 support the center-piece in proper position and prevent it from dropping out of the recess.

In using the die in the machine of the patent referred to suitable dowels 40 may be mounted on the back or reverse face of the body-portion adapted to engage holes in the depending side flanges 42 of the plunger head 44 (see Fig. 1) and the die is held in place on the plunger head by U-shaped end-clamps 46 and butterfly nuts 48 on screws 50 threaded into the ends of the plunger head. The upper flange 52 of each clamp engages the topside of the plunger head and the lower flange 54 fits in a bevelled recess 56 formed in one end of the body portion of the die, whereby the tightening of the nuts 48 causes the die to hug the flanges 42 tightly so that there is no give to the die under the perforating pressure. A spring washer 58 may be interposed between the end of the plunger head and the clamps both to lock the clamp and to facilitate its removal when the nut 48 is loosened in changing or removing the die from the machine.

With the exception of the means just described provided for fastening the die in position on the plunger head, the latter as shown in the drawings is of the same form of construction and mode of operation as that shown in said patent to which reference may be made for a more particular description thereof. In order to facilitate a view of the work-support when the plunger is in a raised position the sides of the body portion and the outer edge of the center-piece may be bevelled at 60 and 62 respectively.

By means of the foregoing construction the changing of dies in the machine and the making up of new combinations of die-parts is much simplified. In changing the dies the end clamps and nuts do not have to be removed but the butterfly nuts are loosened sufficiently to allow the clamps to be moved outwardly to permit the die to drop from the plunger head into the hands of the operator. The center-piece may then be lifted out of the recess and a new center-piece inserted or a new body-portion provided and the center-piece dropped into the recess. The absence of fastening means enables these operations to be performed instantaneously and with a minimum of effort. At the same time the expense of making up different designs is reduced to a minimum since a great variety of designs may be secured with a comparatively few die-parts and at a low expense.

Although I have illustrated my invention as applied to a combination die adapted for use in a machine of the patented type referred to, it is to be understood that this is merely for purposes of exemplification and the invention is not to be limited thereto since it may be embodied in dies for use in other types of perforating machines without regard to the character of the particular work done but where interchangeability of parts is desired.

What I claim is:

1. A combination die comprising a body-portion provided with perforating tubes and an open lateral recess and a center-piece having perforating tubes and removably mounted within said recess, said center-piece being provided on its reverse face with lugs projecting over onto the reverse face of said body-portion for supporting said center-piece within said recess when said die is in a position with its reverse face uppermost.

2. A combination die comprising a body-portion provided with a plurality of tubes set in its right face and with a recess and a center-piece mounted within said recess and provided with tubes set in its right face and with lugs on its reverse face, said lugs projecting over onto the reverse face of said body-portion for supporting said center-piece in position in said recess when the reverse face of said die is uppermost.

3. A combination die comprising a body-portion provided with perforating means on one face and having a centrally disposed recess on one side, and a center-piece, provided with perforating means on one face, mounted within said recess and having means on its other face projecting over onto the corresponding face of said body-portion

for holding said center-piece in position when said die is mounted in a perforating machine.

4. A combination die comprising a body-portion provided with a lateral recess, the two opposite sides of which have each a sub-recess, and a center-piece mounted within said recess and having on each of its two opposite sides an ear fitting one of said sub-recesses; said center-piece being provided with means overlapping said body-portion for holding said center-piece in position when said die is mounted in a perforating machine.

5. A combination die comprising a body-portion provided with an open lateral recess, a center-piece removably mounted within said recess and means mounted on the reverse side of said center-piece and overlapping said body-portion for supporting said center-piece within said recess, the said body-portion and the said center-piece being each provided with perforating means and the said center-piece being removable to permit the insertion of center-pieces having perforating means arranged in different designs.

6. A combination die comprising a body-portion provided with a recess having oppositely indented sides, a center-piece removably mounted within said recess and having side-ears registering in the side indentations of said recess for locking said center-piece within said recess against longitudinal movement, said center-piece being provided on its reverse face with means overlapping said body-portion to prevent said center-piece dropping through said recess when the reverse side of the die is uppermost.

7. A combination die comprising a body-portion provided with an open lateral recess and a center-piece removably mounted within said recess, the engaging sides of said recess and said center-piece being formed to interlock to prevent longitudinal movement of said center-piece in said recess, both said body portion and center-piece being provided on their reverse faces with lugs to support said parts during the perforating operation, the lugs on said center-piece overlapping said body portion to hold said center-piece in position in said recess.

8. A combination die comprising a body-portion provided with perforating tubes and an inwardly extending lateral recess, a center-piece removably mounted within said recess, the respective engaging sides of said recess and said center-piece being formed to interlock to prevent the withdrawal of the said center-piece from said recess in a longitudinal direction, and means carried by said center-piece overlapping said body-portion for holding said center-piece in position when the die is mounted in a perforating machine.

9. A combination die for perforating machines comprising a body portion and a center-piece provided with perforating tubes set in their right faces, said parts being interchangeable with other similar parts to perforate different designs; said body portion being provided with an open inwardly extending lateral recess for receiving said center-piece and said center-piece being provided on its reverse face with overlapping means for holding it in said recess.

10. A combination die for perforating machines comprising a body portion provided with perforating tubes arranged to perforate a sweep-line design and with a lateral center open recess, a center-piece provided with a plurality of perforating tubes arranged to perforate a center design removably mounted in said recess and a plurality of supporting lugs mounted on the reverse face of said center-piece and overlapping said body portion for supporting said center-piece within said recess.

In witness whereof, I hereunto set my hand this seventh day of January, 1924.

WILLIAM F. LAUTENSCHLAGER.