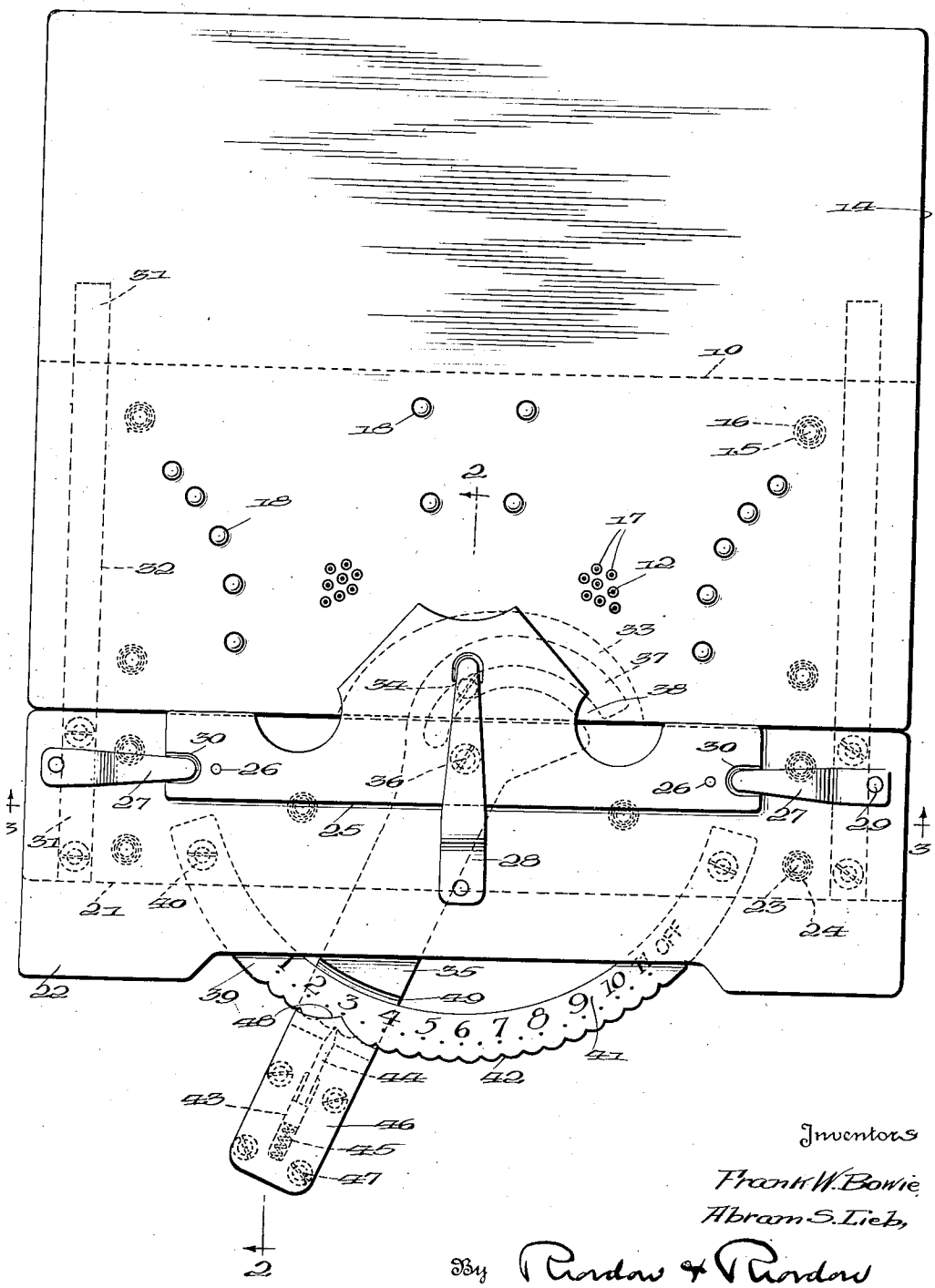
Oct. 26, 1937. F. W. BOWIE ET AL 2,097,363

DIE

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Fig. 1.



Inventors

Frank W. Bowie,

Abram S. Lieb,

By Riordan & Riordan

Attorney

Oct. 26, 1937. F. W. BOWIE ET AL 2,097,363

DIE

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Fig. 2.

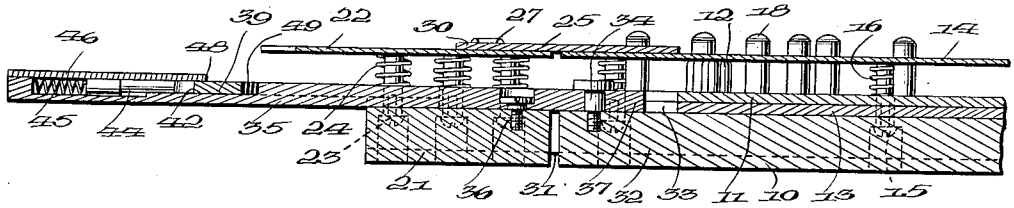


Fig. 3.

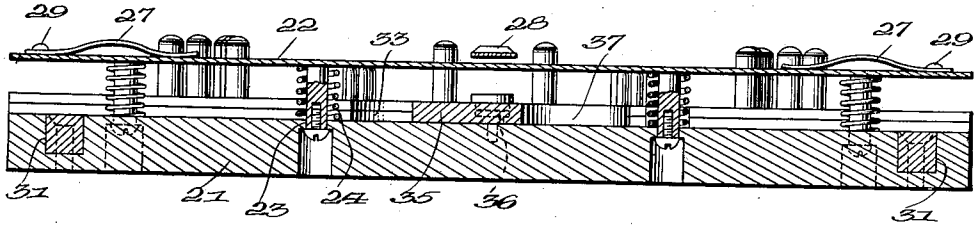


Fig. 4.

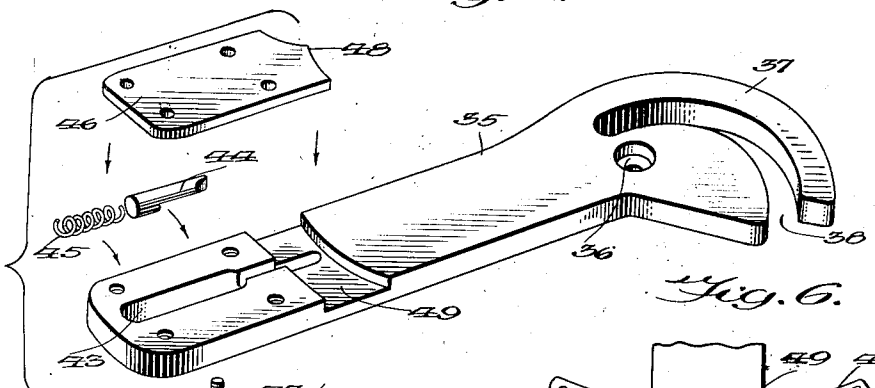


Fig. 6.

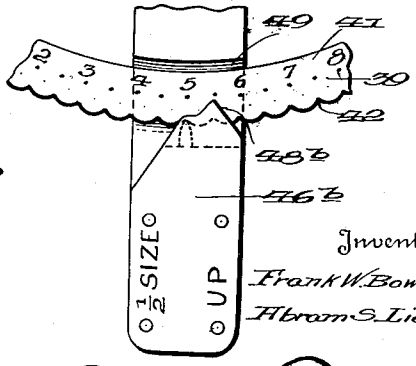
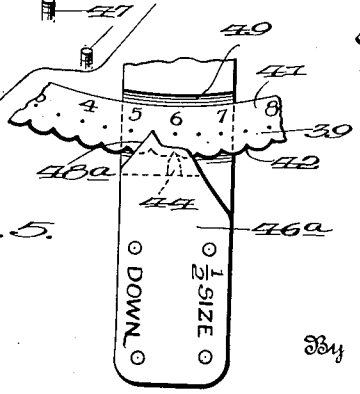


Fig. 5.



Inventors
Frank W. Bowie,
Abram S. Lieb,

By Riordon & Riordon

Attorney

Patented Oct. 26, 1937

2,097,363

UNITED STATES PATENT OFFICE

2,097,363

DIE

Frank W. Bowie and Abram S. Lieb,
Binghamton, N. Y.

Application January 8, 1936, Serial No. 58,186

21 Claims. (Cl. 164—59)

This invention is directed to improvements in cutting dies adapted for use in the ornamentation of shoe uppers, shoe parts, and sheet work, by formation of ornamental cutouts or perforated designs in portions thereof.

A conventional flat bed die for these purposes comprises a base carrying the cutting or perforating members, and a work supporting stripper plate resiliently mounted on the base, adjacent the cutting members. Usually a gage means is mounted upon the die or associated therewith in such a manner as to facilitate placement of the work in position for ornamentation, and to accurately align or locate the work relative to the cutters.

The cutting or perforating members may in themselves be individually formed to produce cutouts of special shape, or may take the form of a plurality of perforating punches or tubes, disposed in an ornamental design, the herein described embodiment of the invention referring to this latter type of die.

The work supporting, stripper plate preferably is located in a plane slightly advanced with respect to the plane of the cutting edges, and is provided with openings through which the cutting elements may operate.

The work gaging or aligning means may take the form of an abutment plate or edge gage, carried by the stripper, or may comprise a series of pins resiliently mounted on the base and projecting through the stripper plate, and in use the work is laid on the stripper plate over the openings, and aligned by abutting an edge thereof against the gage. In some instances the work may be aligned by reference to a seam or mark on the work, if the gage is of a type permitting same.

A problem arises in the use of these conventional types of gage, due to the fact that the work varies in size for a given run. Shoe parts are graded in accordance with the desired size of finished shoe, and, because of the fact that the gage must bear a fixed predetermined relation to the die, and the work is gaged by reference to an edge, it is evident that as the size of the work varies, the relative position of the ornamentation in the work will vary accordingly.

Some shoe manufacturers have attempted to overcome this difficulty by employing a plurality of dies, one for an early portion of the run of graded work, and another for a later portion thereof. This, however, places a burden on the manufacturer of keeping a number of dies on hand.

Other efforts to properly locate the perforations or cutouts in the work have been attempted in flat bed machines by the use of gages which are adjustable to the machine, by equipping dies with adjustable gages, and by making the dies adjustable.

These various methods, however, are unsatisfactory when it is considered that a single shoe may require a number of different dies for ornamenting different parts of the upper, the equipment is complicated, and the dies costly. It is an object of this invention to provide a simple, universal, adjustment unit for ornamenting dies, of such a nature as to be operable interchangeably with various dies as well as to accommodate various sizes of work, whereby the different parts of an upper and the different sizes of parts may be ornamented with equal facility.

Another object is to provide in an adjustable gage unit for such dies, interchangeable gage members whereby the adjustable arrangement may be utilized selectively with a plurality of dies, regardless of whether such dies are designed to ornament vamps, quarters, foxings, etc.

A still further object contemplates an adjustable gage means in which a portion of the gaging means may be fixed, or mounted upon the die in a conventional manner, and another portion of the gaging means movably carried by an adjustable unit, whereby the work is aligned by reference to the relatively adjustable portions.

To the attainment of the foregoing, and other objects which will appear as the description proceeds, reference may be made to the accompanying drawings, in which:—

Fig. 1 is a plan of a complete die to which the adjustable parts have been attached;

Fig. 2 is a section taken on the line 2—2 of Fig. 1;

Fig. 3 is a section taken on the line 3—3 of Fig. 1;

Fig. 4 is an enlarged detail in perspective showing the operating connection between the die proper and the adjustable gage, certain parts being illustrated in disassembled relation;

Fig. 5 is an enlarged plan of a detail of the adjustment indicator; and

Fig. 6 is a similar view showing a different adjustment indicator.

Referring now more particularly to the drawings, in which like reference numerals designate like parts, it will be seen that the die proper, illustrated herein as a flat bed, quarter die, comprises a base 10 upon which is mounted a punch plate 11 carrying a series of punches or tubes 12.

A sub-plate 13 may be interposed between the punch plate and the base if desired. A stripper plate 14 is resiliently mounted on the base by means of studs 15 which are encircled by spring 16, the length of the studs and strength of the springs being such as to yieldingly support the stripper 14 slightly advanced beyond the cutting edges of the tubes or punches 13. The stripper is, of course, suitably perforated as indicated at 17 to permit passage of the tubes 12 through the stripper into contact with work which may be laid thereover. Also resiliently mounted on the base, and projecting through the stripper may be a series of gage pins 18, against which edge portions of the work may be abutted to obtain an approximate alignment of the work on the work supporting stripper plate.

The structure thus far described is more or less conventional in nature, and of course is merely exemplary of one of many forms of die to which the invention may be applied.

For example, the illustrated die may be modified by replacing the gage pins 18 with any of the conventional forms of gage, such as abutment plates mounted on the stripper, clamp gages and the like, or may be dispensed with entirely.

The adjustment with which this invention particularly deals is embodied in the form of a separate, auxiliary unit, movable with respect to the die proper, and is usable with various dies, i. e., quarter dies, vamp dies, etc. By reference to Figs. 1, 2 and 3, it will be seen that this arrangement comprises a base 21, in effect forming a continuation of the base plate 10, and a resiliently mounted plate 22 which in effect forms a continuation of the work supporting or stripper plate 14. Studs 23 encircled by springs 24, similar to the resilient mountings 15—16 serve to support the plate 22 yieldingly in its proper position.

An edge gage 25 is detachably mounted on the plate 22, pins 26 extending from the gage into suitable perforations of the plate 22 serving to locate the position of the gage. Spring fingers 27 at the ends of the gage, and a finger 28 act to clamp the gage plate firmly in position. Each of these fingers is pivotally mounted on the plate 22 as indicated at 29, the gage preferably being slightly recessed as indicated at 30 for the reception of the ends of these fingers.

In order to adjustably mount the auxiliary unit on the die block, the base 21 is provided with elongated guide rails 31 arranged to extend into guide tracks 32 of the base plate 10. These guides 32 may be formed by grooving the base 10 adjacent its ends, and then enclosing same by the sub-plate 13. As illustrated the rails 31 and the guides 32 are approximately rectangular in cross section, but obviously any desired shape may be utilized.

The punch plate 11 and sub-plate 13 are cut away to provide a space or recess 33 above the base 10, and a headed cam stud 34 is mounted on the base 10 to project into the space thus provided at one side of the center line thereof.

An eccentric cam lever 35 is pivotally mounted at 36 on the base plate 21. This lever is formed at its inner end with an enlarged head 37, having an open-ended slot 38, the slot 38 being curved and eccentrically disposed with respect to the pivot 36. When the auxiliary unit is assembled with a die, the stud 34 will be positioned in the slot 38 and movement of the lever 35 about its pivot will, through the eccentric camming action of the stud 34 and slot 38 produce a relative sliding movement between the die and adjustment unit, the unit being guided in its movement by the arms 31 and slots 32.

An arcuate end piece 39 is secured to the base 21 at 40, to extend beyond the outer edge of the unit, over the lever 35. This end piece will bear suitable calibrations 41 to indicate shoe sizes, and will preferably have its outer edge serrated as at 42. The lever 35 is provided with a detent arranged to cooperate with the serrations 42. As illustrated, this detent arrangement may comprise a groove 43 within which is mounted a spring pressed plunger 44, the spring being indicated at 45.

A plate 46 can be suitably secured as by screws 47 over the plunger 44 and channel or groove 43, this plate preferably being equipped with a pointer 48 to cooperate with the calibrations 41 to indicate a proper adjustment. The lever 35 may be channelled transversely as at 49 to ride on the end piece 39.

Having thus described our invention, the use and operation thereof will be readily apparent.

A shoe manufacturer, having selected the die that he intends to use will insert the rails 31 into the guides 32, and engage the cam stud 34 and lever 35. He will then equip the adjusting unit with the proper edge gage 25 (it being understood that the gage 25 is interchangeable with a selected gage necessary for the particular work being treated), and will set the lever 35 to the proper size. As the successive work pieces vary in size a simple adjustment of the lever 35 will produce proper relative position of the gage 25 and unit carrying same with respect to the die proper, and the gage 18.

Should one run of work involve ornamentation of quarters, obviously a quarter gage 25 will be used. Should the work change from quarters to vamps, or foxings, or other portions of an upper, the proper die is produced and the proper gage 25 placed on the auxiliary unit and the unit then assembled with the new die.

It will be evident from the foregoing then that it is only necessary for a manufacturer to carry a single die for a single ornamental pattern, and to carry but one adjustment unit for all patterns. All adjustments of the work, for size, relative to the one die can be effected by use of the adjusting unit which may be assembled with any selected die.

It may be advantageous at various times to cut a pattern in a size smaller, such as cutting a size 6 pattern in a size 7 shoe or vice versa, and in order to take care of this situation, pointer plates 46*a* (Fig. 5) or 46*b* (Fig. 6) may be provided. The pointers 48*a* and 48*b* indicated in Figs. 5 and 6 are respectively offset to one side or the other of the detent 44, according to whether the ornamentation is a size up or a size down, and the adjusted position of the auxiliary unit with respect to the die will be varied accordingly.

Having thus described our invention, what we claim as new and desire to secure by Letters Patent of the United States, is:—

1. The combination with a selected ornamenting die of an interchangeable gage unit for aligning work relative to said die, said gage unit having a base removably connected to said die for reciprocable adjusting movement whereby to accommodate different sizes of shoe parts.

2. The combination with a selected ornamenting die of an interchangeable gage unit for aligning work relative to said die, said gage unit having a base removably and separably connected to said die for reciprocable adjusting movement

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whereby to accommodate different sizes of shoe parts, and said unit being provided with work supporting means.

3. The combination with a selected ornamenting die of an interchangeable gage unit for aligning work relative to said die, said gage unit having a base removably and separably connected to said die for reciprocable adjusting movement whereby to accommodate different sizes of shoe parts, and said unit being provided with work supporting means, and detachable work gaging means.

4. The combination with a selected ornamenting die of an interchangeable gage unit for aligning work relative to said die, said unit having a gage portion shaped to conform to a predetermined characteristic of the work, and a base removably connected to said die for reciprocable adjusting movement whereby to accommodate different sizes of shoe parts.

5. The combination with a selected ornamenting die of an interchangeable gage unit for aligning work relative to said die, said unit having a removable gage portion shaped to conform to a predetermined characteristic of the work, and a base removably connected to said die for recipocable adjusting movement whereby to accommodate different sizes of shoe parts.

6. The combination with a selected ornamenting die of an interchangeable gage unit for aligning work relative to said die, said unit having a gage portion shaped to conform to a predetermined characteristic of the work, and a base removably connected to said die for reciprocable adjusting movement whereby to accommodate different sizes of shoe parts, and means to adjust the relative position of said unit and die to a predetermined extent conforming to shoe sizes.

7. The combination with a selected ornamenting die of an interchangeable gage unit for aligning work relative to said die, said unit having a gage portion shaped to conform to a predetermined characteristic of the work, said portion including a base readily removable from the unit whereby it may be interchanged with different shaped gage portions, and said unit being connected to said die for reciprocable adjusting movement whereby to accommodate different sizes of shoe parts.

8. The combination with a selected ornamenting die adapted to support a shoe part, of an interchangeable gage unit for aligning the part relative to said die, said unit having a gage portion shaped to conform to a known characteristic of the shoe part, and a base removably connected to said die whereby said part may be properly positioned relative to said die, and means to adjust said gauge portion to known grades of work.

9. A gage unit for use interchangeably, in aligning work relative to selected ornamenting dies, comprising a base member, a supporting plate resiliently mounted thereon, a gage element carried by said supporting plate, and means carried by said base constructed and arranged to removably connect said unit to the die, said gage element being shaped to conform to a predetermined characteristic of the work, whereby the work may be aligned relative to the die.

10. A gage unit for use interchangeably, in aligning work relative to selected ornamenting dies, comprising a base member, a work supporting plate mounted thereon, a gage element carried by said supporting plate, and means carried by said base constructed and arranged to detachably connect said unit to a selected conventional die, said gage element being shaped to conform to a predetermined characteristic of the work whereby the work may be aligned relative to the die.

11. A gage unit for use interchangeably, in aligning work relative to selected ornamenting dies, comprising a base member, a supporting plate resiliently mounted thereon, a gage element carried by said supporting plate, and means carried by said base constructed and arranged to adjustably and removably connect said unit to the die said gage element being shaped to conform to a predetermined characteristic of the work whereby the work may be aligned relative to the die, and means to adjust the relative position of said unit and die to known grades of work.

12. A gage unit for use interchangeably, in aligning work relative to selected ornamenting dies, comprising a base member, a supporting plate resiliently mounted thereon, a gage element carried by said supporting plate, and means carried by said base constructed and arranged to adjustably and removably connect said unit to the die, said gage element being shaped to conform to a predetermined characteristic of the work whereby the work may be aligned relative to the die, and additional means interconnecting said unit and die, effective to adjust the relative position of said unit and die to known grades of work.

13. A gage unit for use interchangeably, in aligning work relative to selected ornamenting dies, comprising a base member, a supporting plate resiliently mounted thereon, a gage element carried by said supporting plate, means carried by said base constructed and arranged to adjustably and removably connect said unit to the die, said gage element being shaped to conform to a predetermined characteristic of the work whereby the work may be aligned relative to the die, and means to adjust said unit through a series of positions relative to said die to accord to a series of sizes of shoe parts for a given run of work.

14. A gage unit for use in aligning work relative to an ornamenting die, comprising a base member, a supporting plate resiliently mounted thereon, a work gaging element carried by said supporting plate, a pair of rails extensible into the body of a die, a pivoted cam lever engageable with the die and effective to move said unit toward and from the body of the die, and means for predetermining the extent of movement of said cam lever whereby to predetermine the adjusted position of the unit with respect to the die.

15. A gage unit for use in aligning work relative to an ornamenting die, comprising a base member, a supporting plate resiliently mounted thereon, a work gaging element carried by said supporting plate, a pair of rails extensible into the body of a die, a pivoted cam lever engageable with the die and effective to move said unit toward and from the body of the die, and means for predetermining the extent of movement of said cam lever whereby to predetermine the adjusted position of the unit with respect to the die, comprising a calibrated element carried by said unit base and a detent connection between said lever and said calibrated element.

16. A die for ornamenting shoe parts comprising a base, cutting elements and a work supporting stripper plate, and an adjustable gage unit comprising a base removably connected to said die base, and a work supporting plate car-

ried by said removable base, said removable base and work supporting plate extending respectively through the planes of said die base, and stripper plate, gaging means on said unit, and means interconnecting said unit and said die for relative adjusting movement.

17. A die for ornamenting shoe parts comprising a base, cutting elements and a work supporting stripper plate, and an adjustable gage unit comprising a separable base and work supporting plate extending respectively through the planes of said die base and stripper plate, gaging means on said unit, means interconnecting said unit and said die for relative movement, and means to predetermine the extent of relative movement.

18. A die for ornamenting shoe parts comprising a base, cutting elements and a work supporting stripper plate, and an adjustable gage unit comprising a separable base and work supporting plate extending respectively through the planes of said die base and stripper plate, gaging means on said unit, means interconnecting said unit and said die for relative movement, means to predetermine the extent of relative movement, said last means including indicating means calibrated in shoe sizes.

19. A die for ornamenting shoe parts comprising a base, cutting elements and a work supporting stripper plate, and an adjustable gage unit comprising a separable base and work supporting plate extending respectively through the planes of said die base, and stripper plate, gaging means on said unit, and means interconnecting said unit and said die for relative movement, comprising guide rails extending into said die base, said die base being formed with guide tracks to receive said rails.

20. A die for ornamenting shoe parts comprising a base, cutting elements and a work supporting stripper plate, and an adjustable gage unit comprising a separable base and work supporting plate extending respectively through the planes of said die base and stripper plate, gaging means on said unit, means interconnecting said unit and said die for relative movement, and additional means to predetermine the extent of relative movement, comprising a cam mechanism interconnecting said unit and die.

21. The combination with a selected ornamenting die having work gauging means thereon of an interchangeable gauge unit for aligning work relative to said die, said gauge unit having a base removably connected to said die for reciprocable adjusting movement relative to the gauge means on said die, whereby to accommodate different sizes of shoe parts.

FRANK W. BOWIE.
ABRAM S. LIEB.