

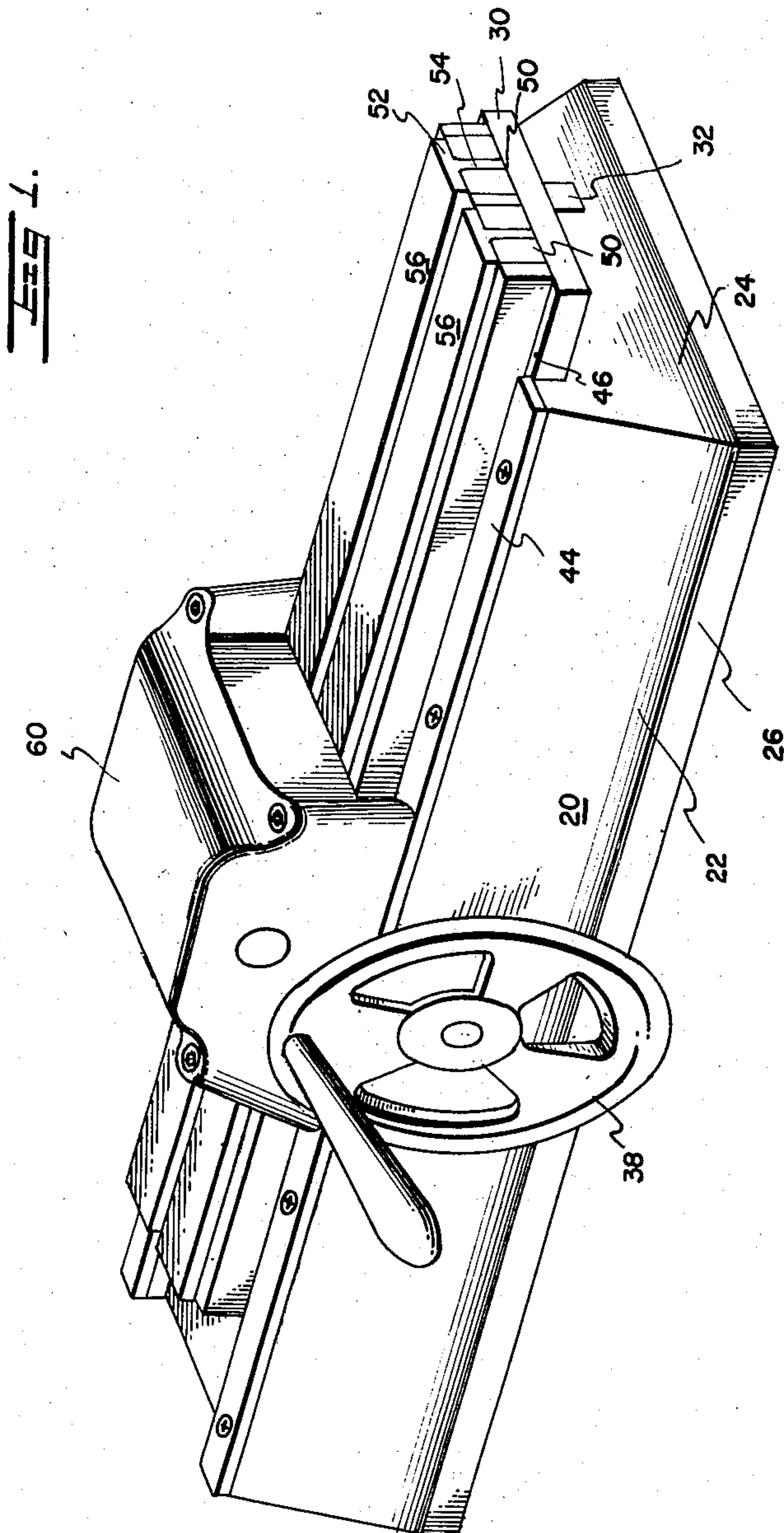
Sept. 2, 1958

J. P. DORR
TYPE KNURLING MACHINE

2,849,903

Filed Dec. 29, 1953

3 Sheets-Sheet 1



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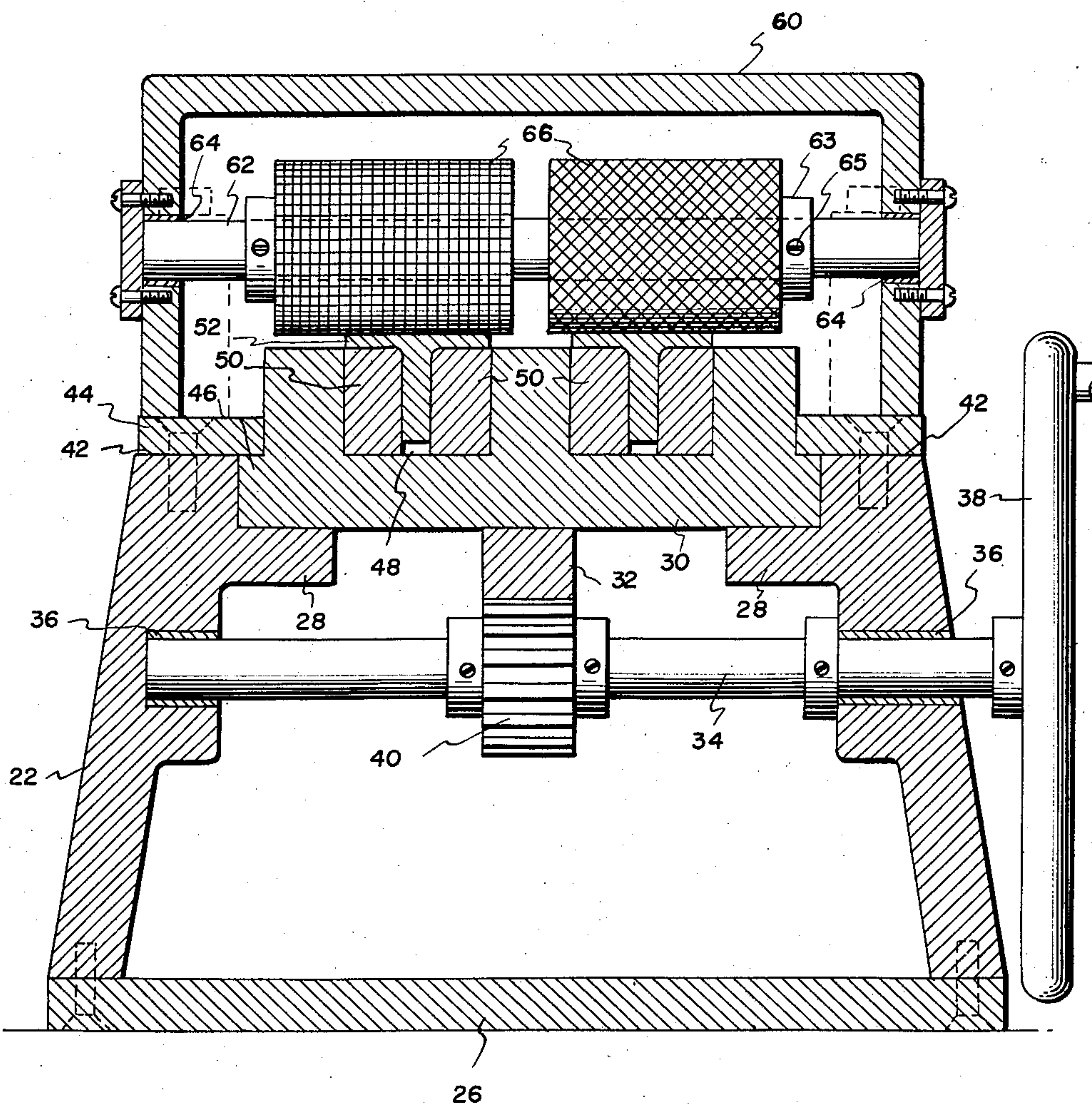
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FIG. 2.



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FIG 3.

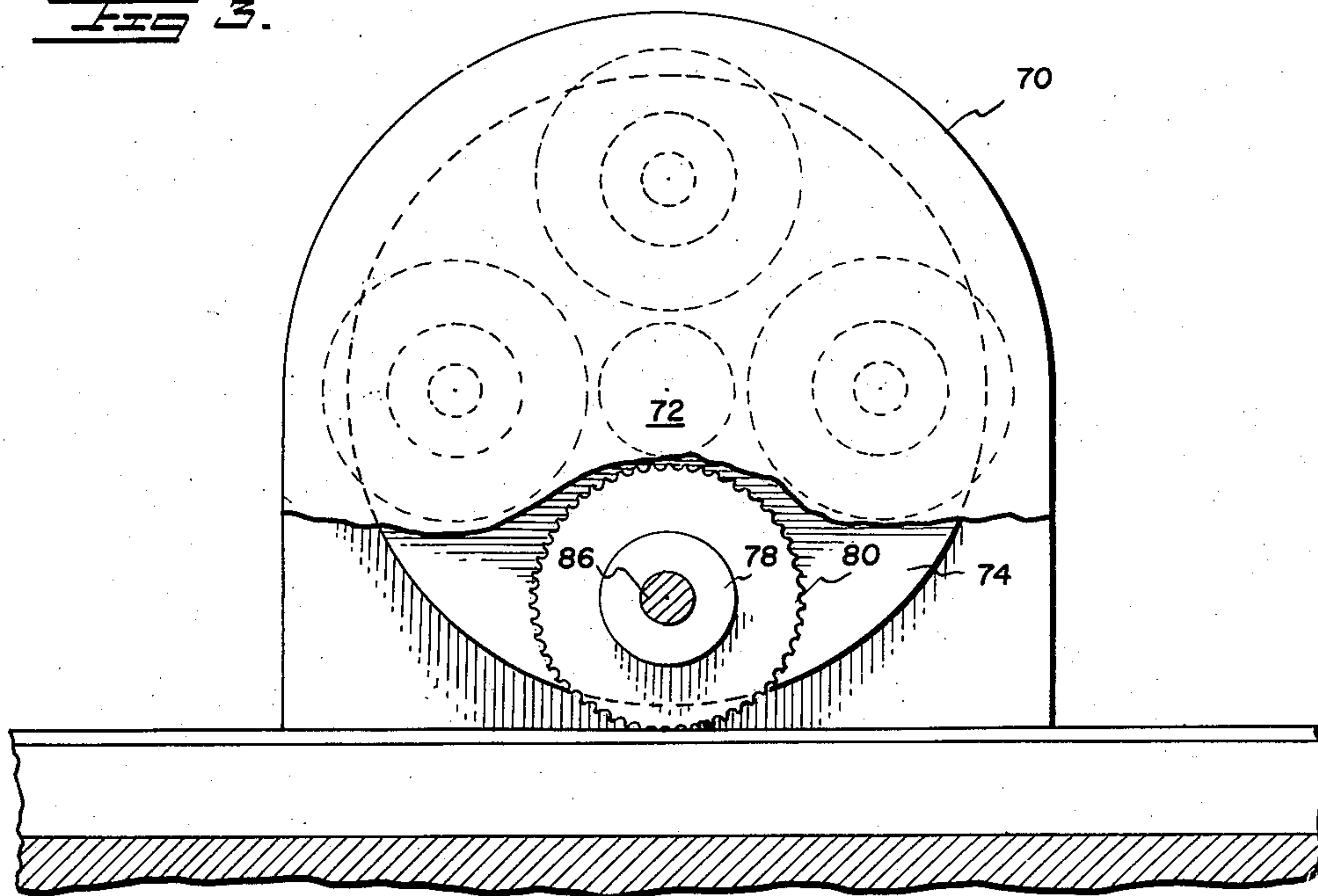
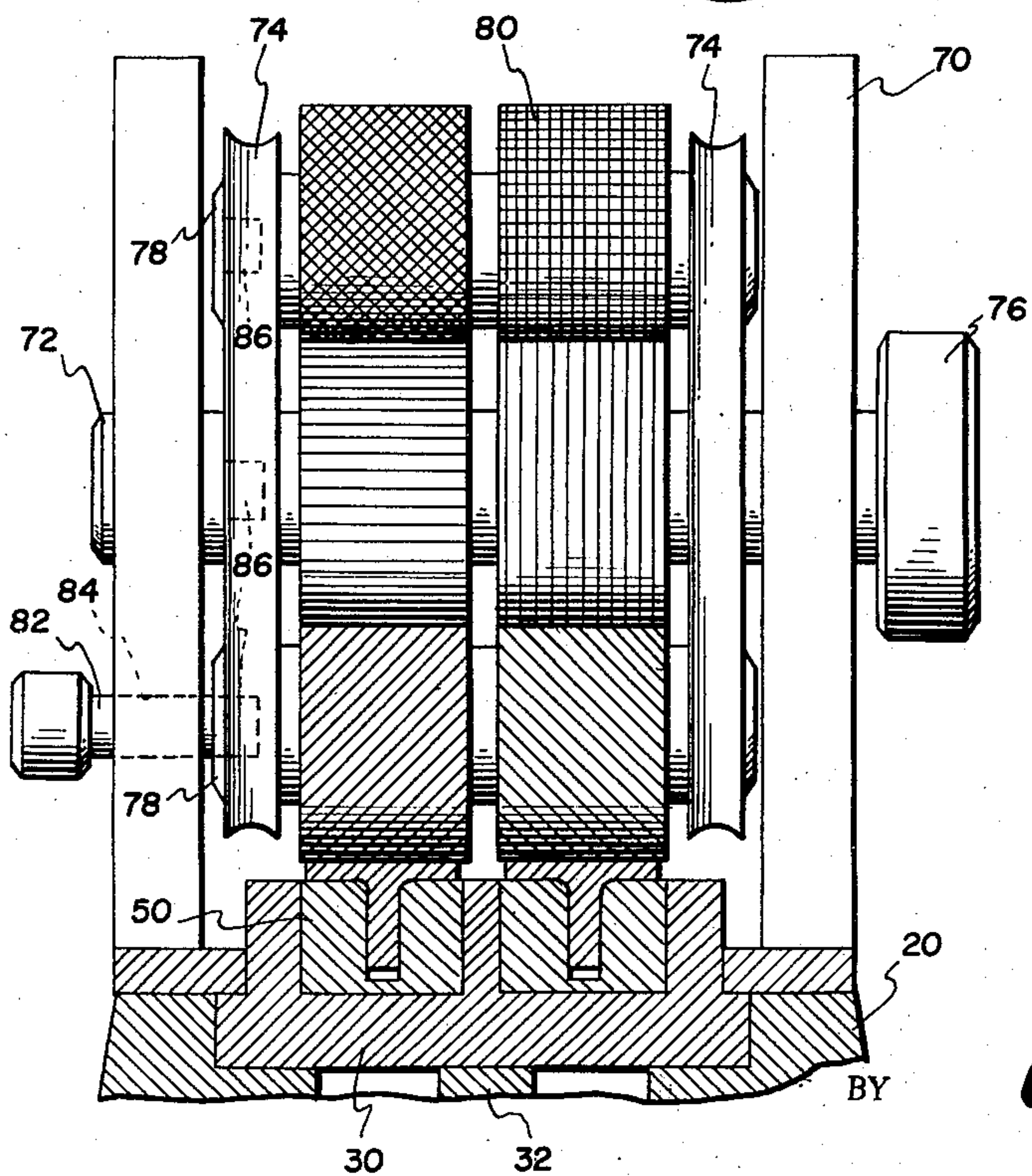


FIG 4.



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TYPE KNURLING MACHINE

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4 Claims. (Cl. 80—5.1)

This invention concerns a machine for knurling type so that it will print differing shades instead of a dead black.

Heretofore, the only way that large type, such as is frequently used in advertising, could be treated to avoid printing black was to actually engrave the face of the type. This could be accomplished by photo-engraving, etching, etc., according to conventional methods in the printing art but, large periods of time and a considerable expenditure of money is necessary in order to change the face of the type for a single advertisement.

An object of this invention is to provide a type knurling machine for knurling the face of large-sized type and selectively providing different knurling designs on the type face. More particularly, an object of the invention is to provide a type knurling machine with different knurling designs which is inexpensive to manufacture and easy to use.

In the attainment of these objects, one feature of the invention resides in the arrangement of a carriage to support type slugs so they may be moved beneath a selected knurling wheel.

In one form, a pair of parallel blocks are arranged to support type slugs in a carriage which may be reciprocated beneath a shaft carrying a pair of knurling wheels of different design. In another form, a carriage having one or more type slug supporting blocks is reciprocated beneath a turret which selectively positions the knurling wheel of a particular design to engage type carried by the block.

Other objects and advantages of the invention will become apparent from the following specification taken in conjunction with the accompanying drawings wherein:

Fig. 1 is a perspective view of a type knurling machine embodying the invention in its preferred form;

Fig. 2 is a cross-sectional view of the machine shown in Fig. 1;

Fig. 3 is a front view, with parts broken away, of a turret assembly embodying a modified form of the invention; and

Fig. 4 is a cross-sectional view of the turret assembly shown in Fig. 3.

The type knurling machine comprises a base 20 formed by side plates 22 and end plates 24 attached to and extending upwardly from the bottom plate 26. Integral with and extending outwardly toward the center of the base 20 at substantially right angles from the upper inner surface of each side plate 22 is a flange or track 28. The tracks 28 extend the length of the inner surfaces of the side plates. Carried by the tracks 28 and slidable thereon is a carriage 30 having a longitudinally disposed rack 32 depending from the center of its bottom surface.

Transversely disposed at substantially the center of the base 20 is a rotatable shaft 34 carried by bearings 36 in the side plates 22. A hand wheel 38 is keyed to the shaft for turning a pinion 40 which engages the rack 32 and causes a translation of the carriage 30 upon the track 28 whenever the hand wheel 38 is rotated.

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Attached to the upper face 42 of each side plate 22 is a locking strip 44 which extends inwardly and engages shoulder 46 on carriage 30 to retain the carriage 30 in position on the tracks 28 during the operation of the type knurling machine.

Two longitudinal parallel channels 48 are formed upon the upper surface of the carriage 30, each channel carrying a pair of spaced parallel supporting blocks 50 arranged to support type slugs 52 with the stem 54 fitting between the supporting blocks 50 so the printing face 56 of the type is exposed.

Located on the underside of the carriage are stops (not shown) which limit the longitudinal movement of the carriage 30 in each direction.

Removably attached to and centrally disposed upon the base is a knurling wheel assembly 60 having a shaft 62 extending transversely above the carriage 30 with the ends of the shaft journaled on bearings 64 on either side. Mounted upon the shaft 62 are a pair of knurling wheels 66 which engage the exposed printing faces 56 of the type 52. Each wheel 66 preferably has a different knurling design. As shown in Fig. 2, the knurling wheel 66 may be fixed on the shaft 62 by a bolt 65 passing through the hub 63 which is integral with the wheel 66.

In the operation of the invention, the type slugs 52, the faces 56 of which are to be knurled, are placed in the supporting blocks 50. Upon turning the hand wheel 38 the pinion 40 rotates and meshes with the rack 32, causing the carriage 30 to slide upon the tracks 28 in the direction of the rotation of the hand wheel 38.

As the clearance between the upper surface of the supporting blocks 50 and the surfaces of the knurling wheels 66 is less than the thickness of the printing faces 56 of the type 52, the exposed printing faces 56 are brought into engagement with the wheels 66 and impart rotation to them. As the type 52 passes under the wheels 66, the printing face 56 is knurled due to the large pressure of the wheels against its exposed surface.

Inasmuch as the type knurling wheels 66 have differing knurling designs, the shading or screen effect accomplished by the knurling is different depending upon which knurling wheel is used. Hence, the operator may select one or the other of the knurling designs and run the type beneath that knurling wheel by inserting the type in the corresponding supporting blocks. The provision of two knurling wheels is sufficient for many installations where two different shadings of the type will provide sufficient variety. However, where a greater variety of shading is required, additional knurling wheels may be readily made available by using a type knurling machine embodying the modified form of the invention as illustrated in Figs. 3 and 4 where a turret assembly 70 is carried by the base 20 at substantially the center of the machine. Mounted on the turret 70 transverse to the base 20 is a main shaft 72 carrying a pair of disks 74. The rotation of the disks 74 is effected by a knob 76 which is attached to one end of the shaft 72.

Angularly displaced from and parallel to the main shaft 72 are a plurality of sub-shafts 78 carried by the disks 74. On each sub-shaft is a pair of knurling wheels 80. As best seen in Fig. 3, the knurling wheels 80 rotate about the longitudinal axis of the main shaft 72 whenever the disks 74 are rotated by the knob 76. The wheels 80 are also rotatable about the longitudinal axis of the sub-shafts 78 independently of the rotation of the disks 74. As each of the wheels 80 may have a different knurling design, the disks 74 are rotated until the desired wheel or wheels are placed directly over the supporting blocks 50 and carriage 30. To lock the wheels 80 in place a stud 82 passes through an opening 84 in the turret into a cavity or socket 86 in the end of the sub-shaft 78.

After the desired wheel or wheels 80 have been selected

and locked into place, translation of the carriage 30 by the hand wheel 38 causes the exposed printing faces 56 of the type slugs 52 to engage one or both wheels 80, and be knurled thereby.

In this modified form of the invention, eight different knurling wheels are easily provided and the number can, of course, be increased by increasing the size of the disk 74 and adding to the number of sub-shafts carried by these disks. For most purposes, it be believed that eight different knurling designs will provide sufficient variety in the shading of type to satisfy most requirements. Thus, by selecting a particular type design, then turning the turret disks until the knurling wheel of that design is disposed above one of the supporting blocks in the carriage, then placing the type in the particular supporting block, the desired knurling design may be formed in the face of the type by turning the hand wheel to reciprocate the carriage and the type beneath the knurling wheel. In this way, a very inexpensive method is provided for creating variety in the face of type used particularly in advertising. This variety is accomplished with practically no increase in the cost of the preparation of the type where it was heretofore necessary to engrave the face of the type which is so expensive as to be almost prohibitive.

Having described the invention fully, what is claimed is:

1. A type knurling machine comprising a base including a pair of side walls, a pair of spaced, parallel tracks extending longitudinally of said base and said side walls, a carriage slidable over said tracks, a locking strip on each of said side walls extending inwardly of said base and in relatively sliding engagement with the upper surface of said carriage, said carriage having a pair of longitudinally extending channels therein, a pair of parallel, spaced, supporting blocks positioned within each of said channels and completely occupying each channel except for a central opening between said pair of spaced blocks for receiving and holding type slugs therein with the printing face upwardly exposed, a rotatable shaft mounted on fixed bearings and extending transversely of said base, a pair of knurling wheels mounted on said shaft above said spaced blocks to respectively engage and knurl the exposed printing faces of type slugs carried by said blocks.

2. A type knurling machine comprising a base including a pair of side walls, a pair of spaced, parallel tracks within said base and extending longitudinally of said base and said side walls, a carriage slidable over said tracks, a locking strip on each of said side walls extending inwardly of said base and in relatively sliding engagement with the upper surface of said carriage, three longitudinally extending, vertical, spaced members integral with the upper surface of said carriage and forming a pair of longitudinally extending channels on said carriage, a pair of parallel, spaced, supporting blocks positioned within each of said channels and completely occupying each channel except for a central opening between said pair of spaced blocks for receiving and holding type slugs therein with the printing face upwardly exposed, a rotatable shaft mounted on fixed bearings on said base and extending transversely a fixed predetermined distance above said carriage, a pair of knurling wheels mounted on said shaft to respectively engage and knurl the exposed printing faces of type slugs carried by said blocks, a rack extending longitudinally beneath said carriage and a pinion carried by said base for engaging said rack between said tracks to slide said rack relative to said tracks and cause a slug carried by either of said blocks to be respectively knurled by engagement with one of said wheels.

3. A type knurling machine comprising a base including a pair of side walls, a pair of spaced parallel tracks within said base and extending longitudinally of said base

and said side walls, a carriage slidable over said tracks, a locking strip on each of said side walls extending inwardly of said base and in relatively sliding engagement with the upper surface of said carriage, said carriage having a pair of rectangular, longitudinally extending channels therein, a pair of separate, rectangular, parallel, spaced, supporting blocks positioned within each of said channels and completely occupying each channel except for a central opening between said pair of spaced blocks for receiving and holding type slugs therein with the printing face upwardly exposed, a rotatable shaft carried by said base and extending transversely thereof, a pair of spaced discs mounted on said shaft, a plurality of sub-shafts carried by said discs and angularly displaced about said shaft, a knurling wheel carried by each of said sub-shafts, means for securing said discs with a selected one of said knurling wheels disposed above said supporting block and means for sliding said carriage along said base to cause a slug carried by said blocks to be knurled by engagement with said selected knurling wheel.

4. A type knurling machine comprising a base including a pair of side walls, a pair of parallel transversely spaced tracks within said base and extending longitudinally of said base and said side walls, a carriage slidable over said tracks, a locking strip on each of said side walls extending inwardly of said base and in relatively sliding engagement with the upper surface of said carriage, a rack depending from said carriage between said tracks, a shaft extending transversely of said tracks, a pinion on said shaft engaging said rack, a hand wheel for turning said shaft to rotate said pinion and translate said rack and carriage relative to said base and tracks, three longitudinally extending, vertical, spaced members integral with the upper surface of said carriage and forming a pair of longitudinally extending rectangular channels on said carriage, a pair of separate, rectangular, parallel, spaced, supporting blocks positioned within each of said channels and completely occupying each channel except for a central opening between said pair of spaced blocks for receiving and holding type slugs therein with the printing face upwardly exposed, a turret assembly carried by said base and arranged above said blocks, said assembly including a main shaft transversely disposed above said blocks, a pair of spaced discs carried by said main shaft, a plurality of sub-shafts carried by said discs and angularly displaced about said main shaft, a pair of knurling wheels carried by each of said sub-shafts and arranged to engage the exposed faces of type slugs carried by said blocks, and means for securing a selected one of said sub-shafts in position with its knurling wheel disposed above said carriage whereby a translation of said carriage by rotation of said hand wheel causes a type slug in one of said blocks to engage a respective one of said knurling wheels and be knurled thereby.

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