

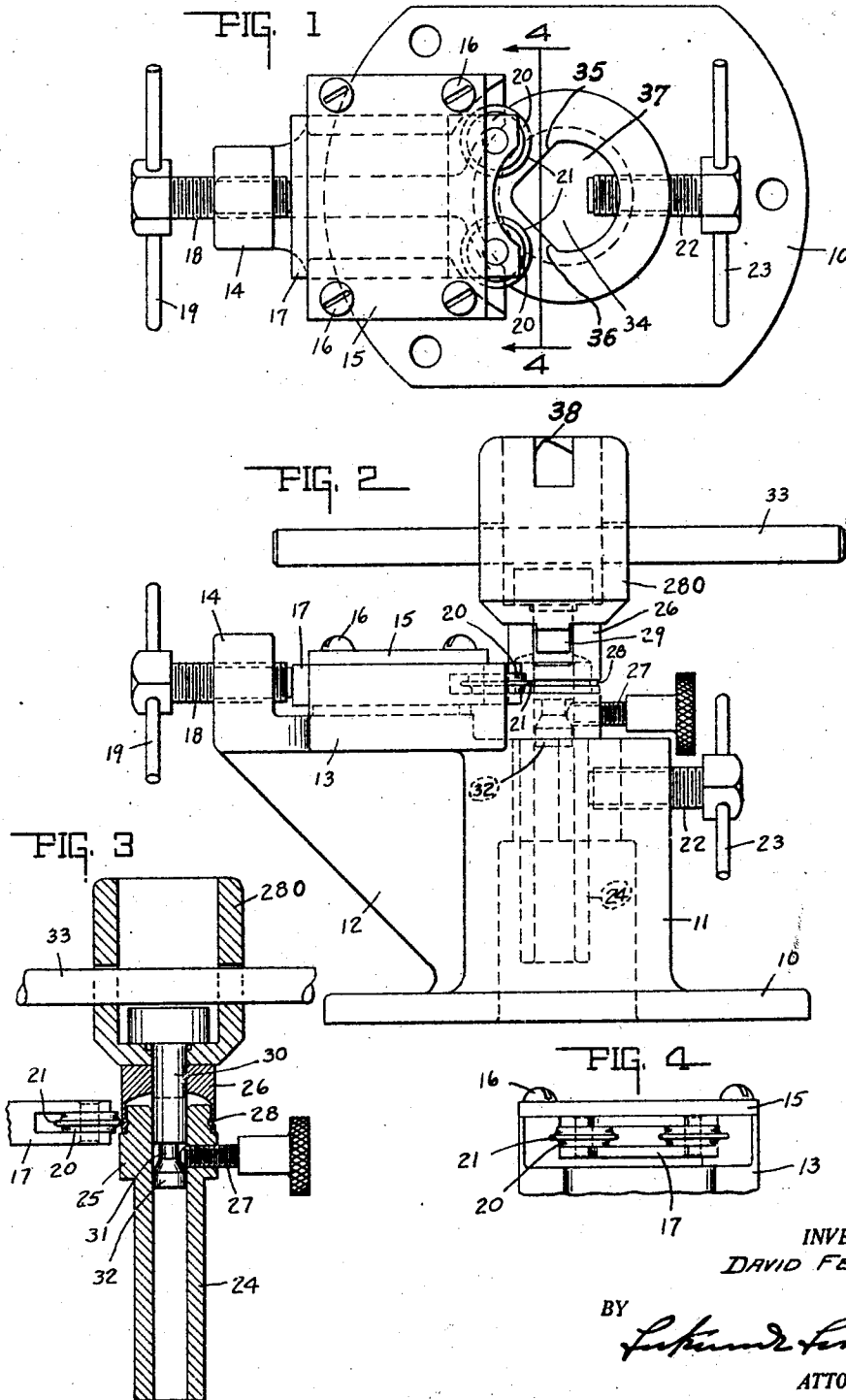
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ROLLING DEVICE FOR BEADING OPERATION

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ROLLING DEVICE FOR BEADING OPERATION.

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This invention relates to a rolling machine particularly adapted for rolling an inwardly extending bead about the periphery of a member so as to cause the bead so rolled to extend into a corresponding recess formed about the periphery of the member to which it is to be attached.

The main object of the invention is to provide a rolling device so arranged and combined with a holding or clamping vise as to manually roll an inwardly extending bead in the peripheral wall of a female piece of work into a corresponding recess or groove formed on the peripheral surface of a corresponding male piece of work disposed in free working relation within said female work, such rolling being carried out by the manual rotation of said female work against a roller means having relatively fixed pivot means, whereby the completion of such rolling process is automatically indicated by the frictional resistance of said bead in said recess, due to the corresponding resistance to the manually rolling thereof, by which arrangement it is very easy to form said bead in loose working relation with said recess and thereby effect what is known as a running fit therewith.

One feature of the invention resides in the holder or vise for holding such male pieces of work in place while being operated upon, and another feature of the invention resides in the means associated with the vise or holder for operating upon the work and so rolling it as to manually control the rolling operation.

The full nature of the invention will be understood from the accompanying drawings and the following description and claims.

In the drawings, Figure 1 is a plan view looking down upon the vise and beading rollers with the work removed therefrom. Fig. 2 is a side elevation showing the work mounted in position, having the operating wrench mounted in place. Fig. 3 is a central vertical section through the work showing the operating wrench secured therein and one of the beading rollers in operative engagement. Fig. 4 is a view taken on the line 4-4 of Fig. 1 showing a front elevation of the beading rollers.

In the drawings there is shown a vise or work holder adapted to be rigidly secured to a bench or the like having a base 10 and

a centrally recessed supporting standard 11. Extending outwardly from the standard 11 and braced by the web 12 so as to be rigid with respect thereto, there is a tool containing slide 13 provided with an internally screw threaded projection 14. Across the top of the sides of the slide 13, there is a top plate 15 rigidly secured thereover by the screws 16. Slidably mounted within the slide, there is a tool 17 which may be forced forwardly by the screw 18 and operated by the handle 19. Rotatably mounted in the forward edge of the tool 17, there is a pair of rollers 20 provided with bead forming flanges 21. Extending diametrically through the side of the supporting standard 11, there is a securing screw 22 operated by the handle 23.

The work may consist of the hollow shaft 24 having a head 25 thereon upon which it is desired to secure the connecting key 26. The head 25 is provided with a screw threaded radial opening through which the thumb screw 27 may extend. Extending about the periphery of a reduced portion of the head 25, there is formed an annular recess 28 into which the metal forming a portion of the surrounding shell of the key 26 is adapted to be forced by the beading operation. For turning the work in the holder, there is provided a wrench having a head 280 and radial projections 29 adapted to fit in a slot in said key as shown in Figure 2, between which there is a pin 30 extending downwardly through the bottom of the head 280 through the center of the key 26 and into the head 25 and shaft 24. The pin is provided with a reduced neck portion 31 and a head 32 which may be engaged by the end of the screw 27 when it is tightened in place. Upon so mounting the wrench and securing it in place by the screw 27, the head 25 of the work and the connecting key 26 will be rigidly secured together and to the wrench, so that the same may be turned by grasping and manually turning the rod 33 extending diametrically through the head 280.

In operation, the connecting key 26 is placed in position over the head 25 of the shaft 24. The wrench is then mounted in place so that the pin 30 extends downwardly through said head 25 and is rigidly secured therein by the screw 27. The shaft 24 with the wrench secured thereon is then inserted

in the central opening 34 of the vise and held therein by the screw 22. The handle 19 is then turned so as to force the tool 17 forwardly until the flanges 21 of the rollers 20 engage the periphery of the connecting key 26. The holder or vise 11 and its associated parts are so constructed that the flange 21 will be immediately opposite the recess 28 formed about the periphery of the head 25, whereby upon further turning the handle 19, the roller flanges 21 will force the metal of the surrounding shell into said recess. Upon then grasping and turning the rod 33, so that the connecting key 26 is turned with respect to said rollers, the connecting shell surrounding the groove 28 will be rolled therein and the bead connection will thereby be formed.

In accordance with the aforesaid main object of my invention, the key 26 is an example of the female type work which my invention is adapted to receive and 24 is the corresponding male member, it being desired to lock said male member in coupled engagement within said female member by means of the rolling operation above described. It is understood that said male member is disposed within said female member in free rotatable relation in respect thereto, said members forming with each other thereby what is known as a running fit. It is therefore important in rendering said members in beaded engagement as above described, that the bead rolling operation should not be continued long enough to engage said tongue in tight contact with the recess 28. It is therefore important that the head 280 be manually rotated by means of the rod 33, as before described, so that the operator may readily ascertain when the afore-described rolling operation has been completed, it being understood that when said tongue has been rolled sufficiently deep enough into said recess said tongue will begin to bind frictionally within same and thereby resist the manual rotation of the key 26 and the head 280, by which the operator will know when the rolling operation is complete, as this will automatically prevent the key 26 from being engaged rigidly to the head 25.

Referring again to the thumb screw 27 which engages the neck 31 of the pin 30, as before mentioned the threaded end of said screw terminates in a conical or nose type point. It will also be observed that the lower surface of the neck 31 is of conical or bevel shape. In accordance with this the screw 27 is suitably located in the head 25 so that said screw will engage the neck 31 on the conical surface of said neck, being suitably located to bring the bevel surface of said screw end in contact with said conical surface of the neck 31 by which arrangement engagement of said screw with the head 32 will cause said pin 30 to be cammed down-

ward within the hollow pin 24, the key 26 being thus firmly clamped thereby, on the head 25, the tightness of which relation may be varied as desired by correspondingly varying the tightness of the screw 27 against the head 32.

Referring to the central opening 34, in the standard 11, more particularly as shown in Fig. 1, attention is called to the V shaped structure formed within said opening by the vertical surfaces 35 and 36 which are arranged symmetrically in regard to the screw 22 and the rollers 20. Still referring to Fig. 1, the dotted lines 37 indicate the normal position of the hollow shaft 24 within said opening. It will be noticed that pressure of the screw 22 against said pin confines said pin between the surfaces 35 and 36 and the end of said screw, said pin being thus centralized by said surfaces in relation to the rollers 20 and thus held in suitable position for the rolling operation.

Referring again to the head 280, the upper portion of said head, it will be observed, forms a sleeve structure in which is formed a radial notch 38 in the upper edge thereof, as shown in Fig. 2 by which arrangement said head forms a somewhat special spanner wrench more particularly adapted under certain conditions to engage the pin 24 when the head 280 is in reversed position in respect to said pin in which case said notch engages the screw 27 and the said sleeve formation of the head 280 engages the head 25, said head being in reversed relation in respect to Fig. 2 and Fig. 3. By this arrangement the head 280 will serve as a holder or wrench for the pin 24 as desired when performing other work on said pin, not described herein.

Referring again to the screw 27 in respect to the neck 31 it is understood that said neck together with the pin 30 and the head 280, may be rotated independently in respect to the screw 27, in which case said screw will be in frictional engagement with said neck.

While I have illustrated in a general way, certain instrumentalities which may be employed in carrying my invention into effect, it is evident that many modifications may be made in the various details, without departing from the scope of the appending claims, it being understood that my invention is not restricted to the particular forms herein described.

The invention claimed is:

1. A rolling mechanism adapted to receive a sleeve shaped stationary piece of work and a sleeve type female piece of work engaged over said stationary work in free rotatable relation thereto, said mechanism having a relatively stationary roller means adapted to be brought into rolling contact with said female work; a headed rod means telescoped within said pieces of work, hav-

ing a concentric groove within said stationary work, the head of said rod means engaging said female work; and a screw means threaded thru the wall of said stationary work and adapted to engage the lower corner of said groove and thereby cam said rod means longitudinally in said members for retaining said female work on said stationary work.

2. A rolling mechanism adapted to receive a sleeve shaped stationary piece of work and a sleeve type female article of work engageable over said stationary piece in free rotatable relation thereto, said mechanism having a relatively stationary roller means adapted to be brought into rolling contact with said female article; a headed rod means telescoped within said work, having a ledge within said stationary member, the head of said rod means engaging said female article; and a screw means threaded thru the wall of said stationary piece and adapted to engage said ledge and adapted to thus cam said rod means longitudinally in said work for retaining said female article on said stationary piece, said screw means being stationary in respect to said ledge when said rod means is rotated.

3. A rolling mechanism adapted to receive a stationary male piece of work having a concentric groove means and a cylindrical female piece of work engaged over said male work in rotatable running fit relation thereto; a relatively stationary roller means adapted to roll part of the cylindrical female work into said groove means when said female work is revolved; and a manual means for revolving said female work adapted to indicate when said part of said female work has been rolled into frictional contact with said groove means by the corresponding resistance of said frictional contact to said manual means; for rolling said female work into retained running fit relation with said male work.

4. A rolling mechanism adapted to receive a stationary male piece of work having a groove, and a cylindrical female piece of work engaged over said male work in rotatable running fit relation thereto, said female work having an external key; a relatively stationary roller means adapted to roll part of said female work into said groove when said female work is revolved; a manual means for revolving said female work adapted to indicate when said part of said female work has been rolled into frictional contact with said groove, by the corresponding resistance of said frictional contact felt in said manual means, said manual means comprising a wrench means adapted to engage said key; a degageable clamp means adapted to hold said male work symmetrical with said roller means; and a manual means adapted to feed said roller

means into rolling contact, the last mentioned manual means being simultaneously operatable with the first mentioned manual means; for rolling said female work into grooved relation with said male work.

5. A rolling mechanism adapted to receive a stationary male piece of work having a circumferential groove, and a cylindrical female piece of work engaged over said male work in rotatable running fit relation thereto; a relatively stationary roller means adapted to roll a part of the cylindrical female work into contact with said groove when said female work is revolved; a V clamp means adapted to hold said male work axially parallel with said roller means; and a means adapted to engage said female work for revolving same on said male work.

6. A rolling mechanism adapted to receive a sleeve shaped stationary male piece of work having an external groove, and a sleeve type female piece of work engaged over said male work in free rotatable relation thereto, and adapted to have its adjacent portion rolled into said groove; a roller means having a slidably mounted pivot means; said roller means being in diametrical alignment with said groove; a screw means adapted to feed said pivot means toward said female work and thereby bring said roller means into rolling contact with said female work; and a manual means for revolving said female work adapted to indicate when said adjacent portion of said female work has been rolled into frictional contact with said groove by the corresponding resistance of said frictional contact to said manual means; for rolling said female work into locked running fit relation with said male work.

7. A rolling mechanism adapted to receive sleeve shaped stationary work, and a cylindrical female piece of work in free rotatable relation thereto; a roller means having a slidably mounted pivot means; a screw means adapted to feed said pivot means toward said female work and thereby bring said roller means into rolling contact therewith; a manual means for revolving said female work adapted to indicate when said female work has been rolled into frictional contact with said stationary work by the corresponding resistance of said frictional contact to said manual means; for rolling said female work into running fit relation with said stationary work; and a V type clamp means adapted to centralize said male work with said roller means.

8. A rolling mechanism adapted to receive a sleeve shaped stationary male piece of work and a sleeve type female piece of work engaged over said male work in free rotatable relation thereto, said male work having an external groove; a roller means having a slidably mounted pivot means; a screw means adapted to feed said pivot

means toward said female work and thereby bring said roller means into rolling contact with said female work; a manual wrench means for engaging and revolving said female work adapted to indicate when the adjacent portion of said female work has been rolled into frictional contact with said groove by the corresponding resistance of said frictional contact to said manual means, for rolling said female work into grooved relation with said male work; a headed rod means telescoped within said pieces of work, having a groove concentric with said female piece of work and disposable within said male work, the head of said rod means engaging said female work; and a screw means threaded thru the wall of said male work and adapted to engage the lower corner of said groove and adapted to thus cam said rod means longitudinally in said work for retaining said female work on said male work during the rolling operation.

9. A rolling mechanism adapted to receive sleeve shaped stationary work and sleeve type female work engaged over said stationary work in free rotatable relation thereto; a relatively stationary roller means adapted to be brought into rolling contact with said female work; a screw threaded thru the wall of said stationary work, said screw being nosed inwardly within same; a headed rod means telescoped within all of said work, having a groove concentric with said work, the remote side of which in respect to the headed portion of said rod, engages the nose of said screw by which said rod means may be cammed longitudinally within said work, said groove being rotatable against and in respect to said screw, for camming the head of said rod means against said female work, to retain same on said stationary work during the rolling operation.

10. A rolling mechanism adapted to receive a cylindrical stationary male piece of work having a concentric groove means, and a cylindrical female piece of work engaged over said male work in rotatable running fit relation thereto, said female work having a key formed thereon; a roller means adapted to roll the adjacent part of said female work into said groove means; a slidably mounted pivot means for said roller means adapted to carry the same into rolling contact with said female work; a headed rod means telescoped within said pieces of work, having a concentric groove within said male work; a head of said rod means engaging said female work; a screw means threaded thru the wall of said stationary work and adapted to engage the remote part of said groove, in respect to said head, and adapted to thus cam said rod means longitudinally in said pieces of work, said screw means being stationary in respect to said groove when said

rod means is rotated; a manual screw means adapted to feed said pivot pins toward said female work; a manual means for rotating said female work adapted to automatically indicate when said adjacent part of said female work has been rolled into running fit relation with said groove means by corresponding frictional resistance of said part within said groove means, felt in said manual means, said manual means comprising a wrench means one part of which is adapted to be engaged with said key and another part of which is adapted to be outwardly disposed of said male and female work said other part having a notch means engageable with the outwardly extending portion of the first mentioned screw means, for revolving said male work when desired, said manual means being operatable concurrently with the first mentioned manual means when engaged with said key, and when said female work is rotated in the rolling process as desired; and a degageable clamp means adapted to hold said male work symmetrical with said roller means as desired.

11. A rolling mechanism adapted to receive a cylindrical stationary male piece of work having a concentric groove and cylindrical female work engageable over said stationary work in rotatable running fit relation thereto, said female work having key means formed thereon; a roller means adapted to roll the adjacent part of said female work into said groove; a slidably mounted pivot means for said roller means adapted to carry said roller means into rolling contact with said female work; a manual means for rotating said female work adapted to automatically indicate when said adjacent part of said female work has been rolled into running fit relation with said groove means by corresponding frictional resistance of said part within said groove means, felt in said manual means, said manual means having a head, one part of which is adapted to be engaged with said key means and another part of which is adapted to be outwardly disposed of such work and engaged in wrench relation thereto, when desired; and a degageable clamp means adapted to hold said stationary work symmetrical with said roller means when desired.

12. A tool of the class described comprising a head provided with a socket in one face, a second face being provided with a lug to engage the work, a rod carried by the head and extending beyond the lug, said rod being provided with means for holding the same to the work, and means for operating on the work.

13. A tool of the class described comprising a head provided with a socket in one face, a second face being provided with a lug to engage the work, a rod carried by the

head and extending beyond the lug, means for holding the rod to the work, a turning lever carried by the head, and means for operating on the work.

5 14. A tool of the class described comprising a head provided with a socket in one face, a second face being provided with a lug to engage the work, a rod carried by the head and extending beyond the lug, the
10 outer end portion of the rod being provided with a circumferentially disposed groove, means for holding the rod to the work, and means for operating on the work.

15 15. A tool of the class described comprising a head provided with a socket, work engaging means carried by the head, a rod carried by the head and extending within the socket thereof, said rod within the
20 socket being provided with a head, a lever disposed through the first named head and coacting with the head of the rod to hold the rod in applied position, means for holding the rod to the work, and means for operating on the work.

25 16. A rolling mechanism adapted to receive a stationary male piece of work having a groove, and a cylindrical female piece of work engaged over said male work in rotatable relation thereto, said female
30 work having an external key; a relatively stationary roller means adapted to roll part of said female work into said groove when said female work is revolved; and a manual means for revolving said female work
35 adapted to indicate when said part of said

female work has been rolled into frictional contact with said groove, by the corresponding resistance of said frictional contact felt in said manual means, said manual means comprising a wrench means adapted to engage said key.

17. A rolling mechanism adapted to receive a stationary male piece of work having an external groove means, and a cylindrical female piece of work engaged over said male
45 work in running fit relation thereto, said female work having a key formed thereon; a roller means adapted to roll part of said female work into said groove means; a two headed rod means telescoped within said
50 pieces of work, having one head within said male work and another head adapted to externally engage said female work; a screw means threaded through the wall of said stationary work and adapted to glancingly
55 engage the first mentioned head and thereby tend to cam said rod means longitudinally within said pieces of work; and a wrench means one part of which is adapted to be engaged with said key for revolving said
60 female work on said male work in the rolling operations, and another part of which is adapted to be outwardly disposed on said male piece of work, when desired, said other part having a notch engageable with the outwardly extending portion of said screw
65 means.

In witness whereof, I have hereunto affixed my signature.

DAVID FERGUSON.