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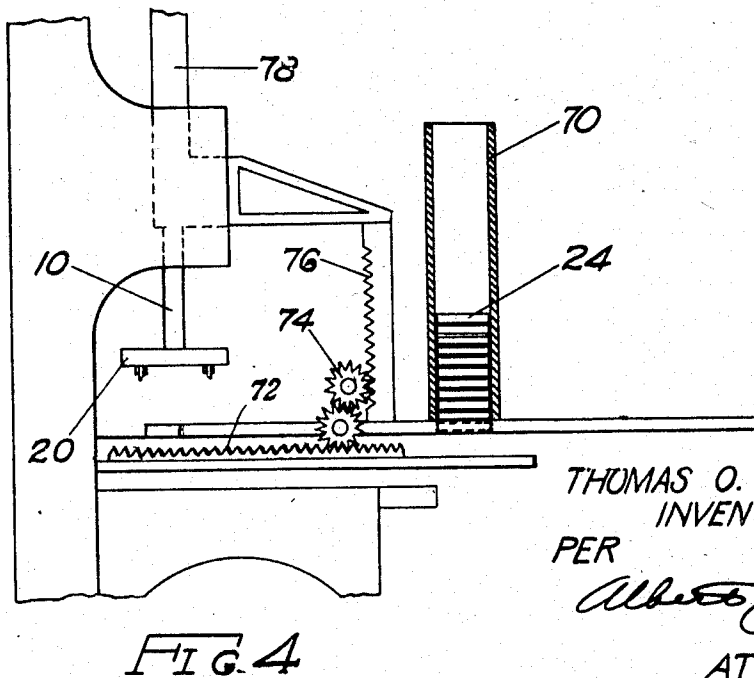
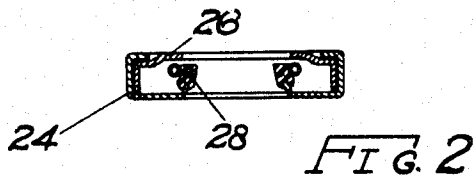
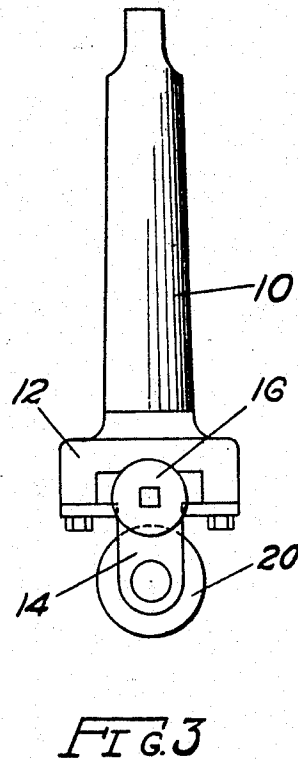
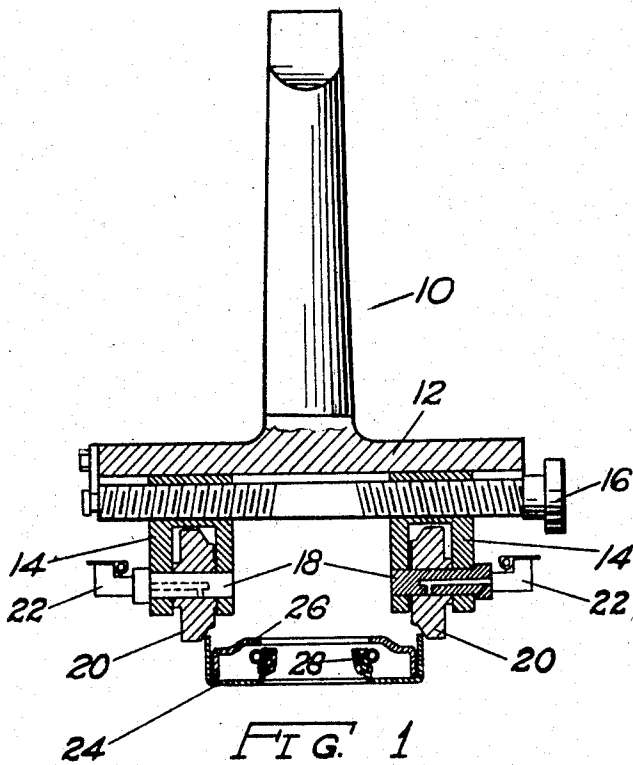
T. O. KOSATKA

2,223,324

CLOSING MEANS FOR METAL SHELLS

Filed Oct. 29, 1938

5 Sheets-Sheet 1



THOMAS O. KOSATKA
INVENTOR
PER
Albert J. Fike
ATTORNEY

Nov. 26, 1940.

T. O. KOSATKA

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CLOSING MEANS FOR METAL SHELLS

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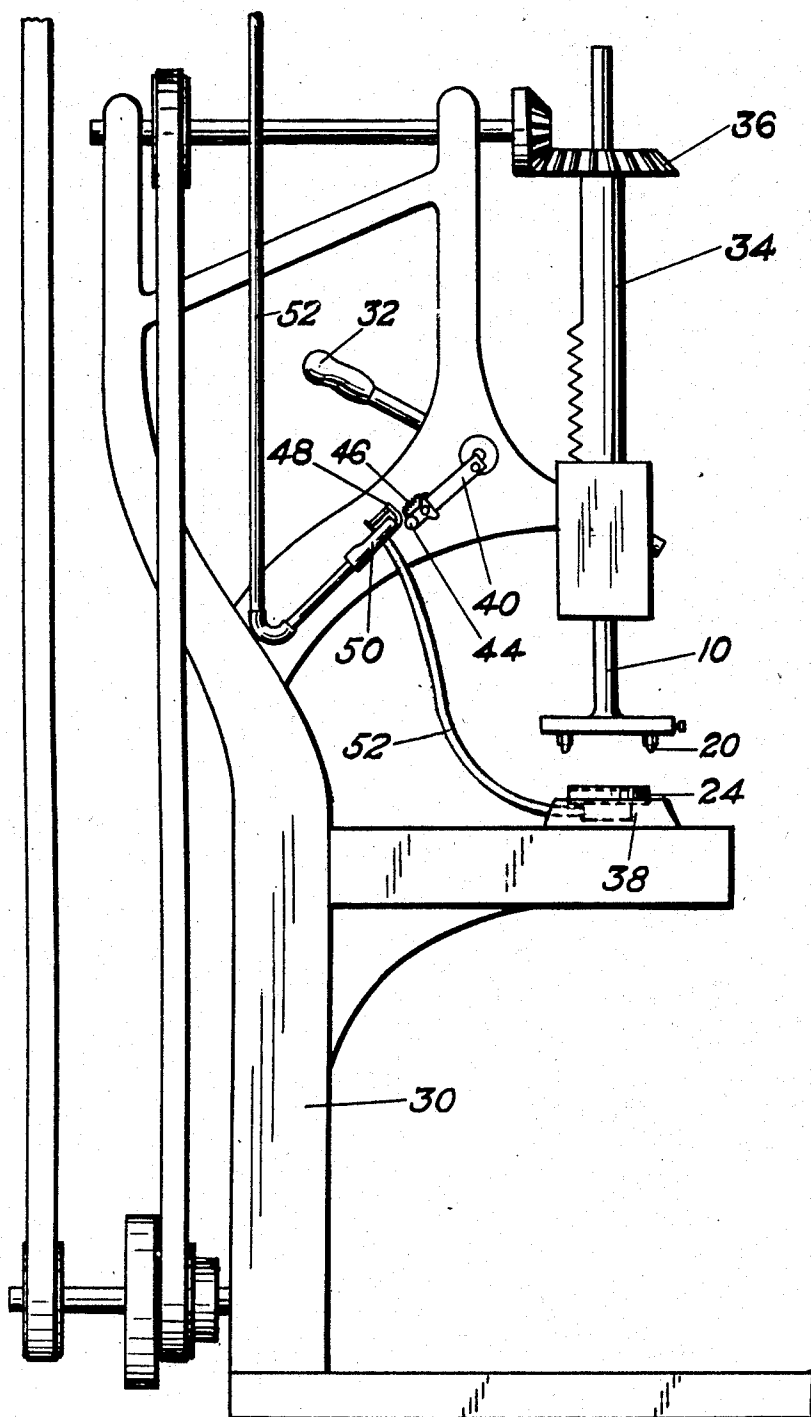


FIG. 5

THOMAS O. KOSATKA
INVENTOR

PER

Albert J. Fike

ATTORNEY

Nov. 26, 1940.

T. O. KOSATKA

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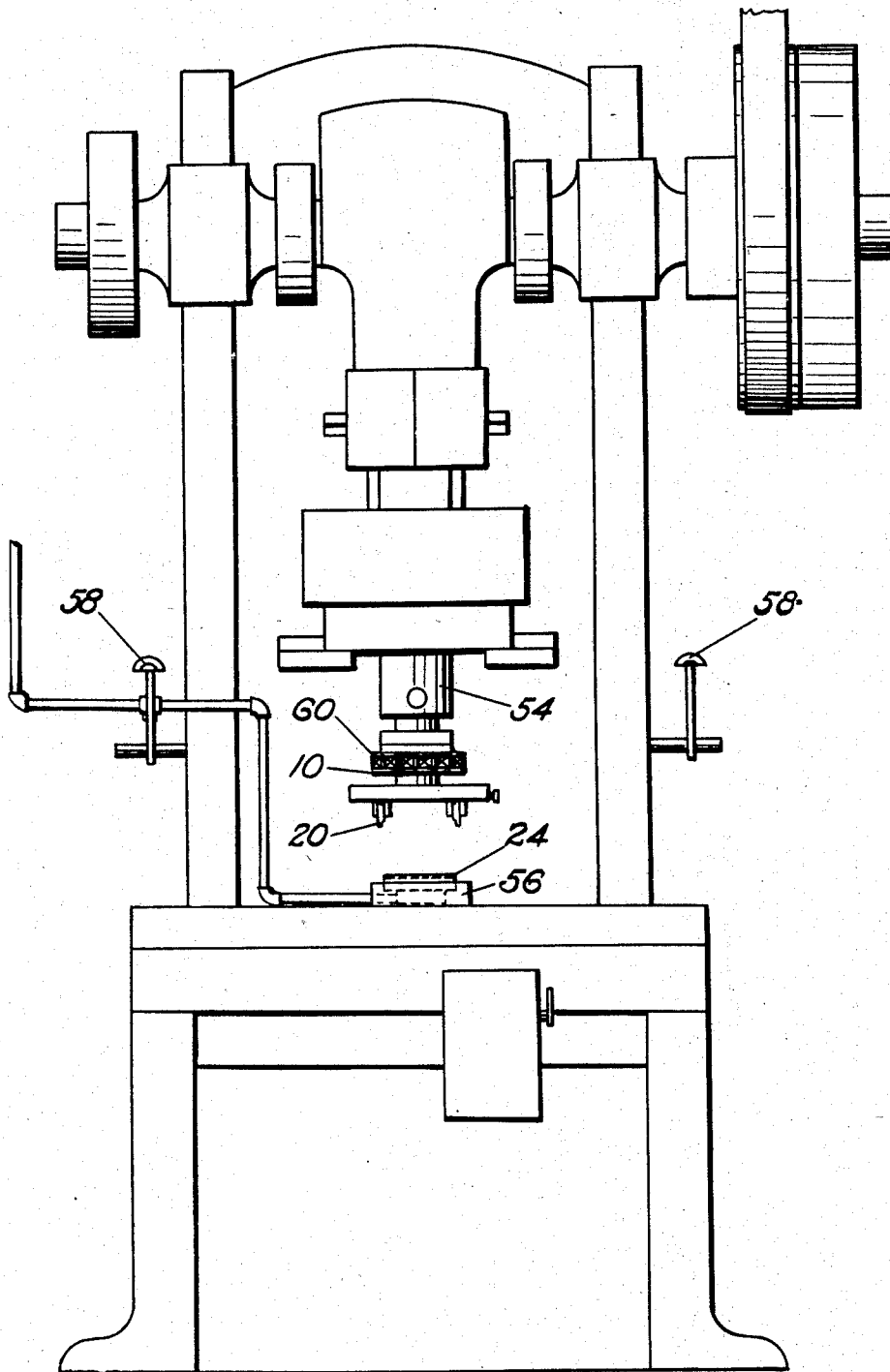


FIG. 6.

THOMAS O. KOSATKA
INVENTOR

PER

Albert J. Frie

ATTORNEY

Nov. 26, 1940.

T. O. KOSATKA

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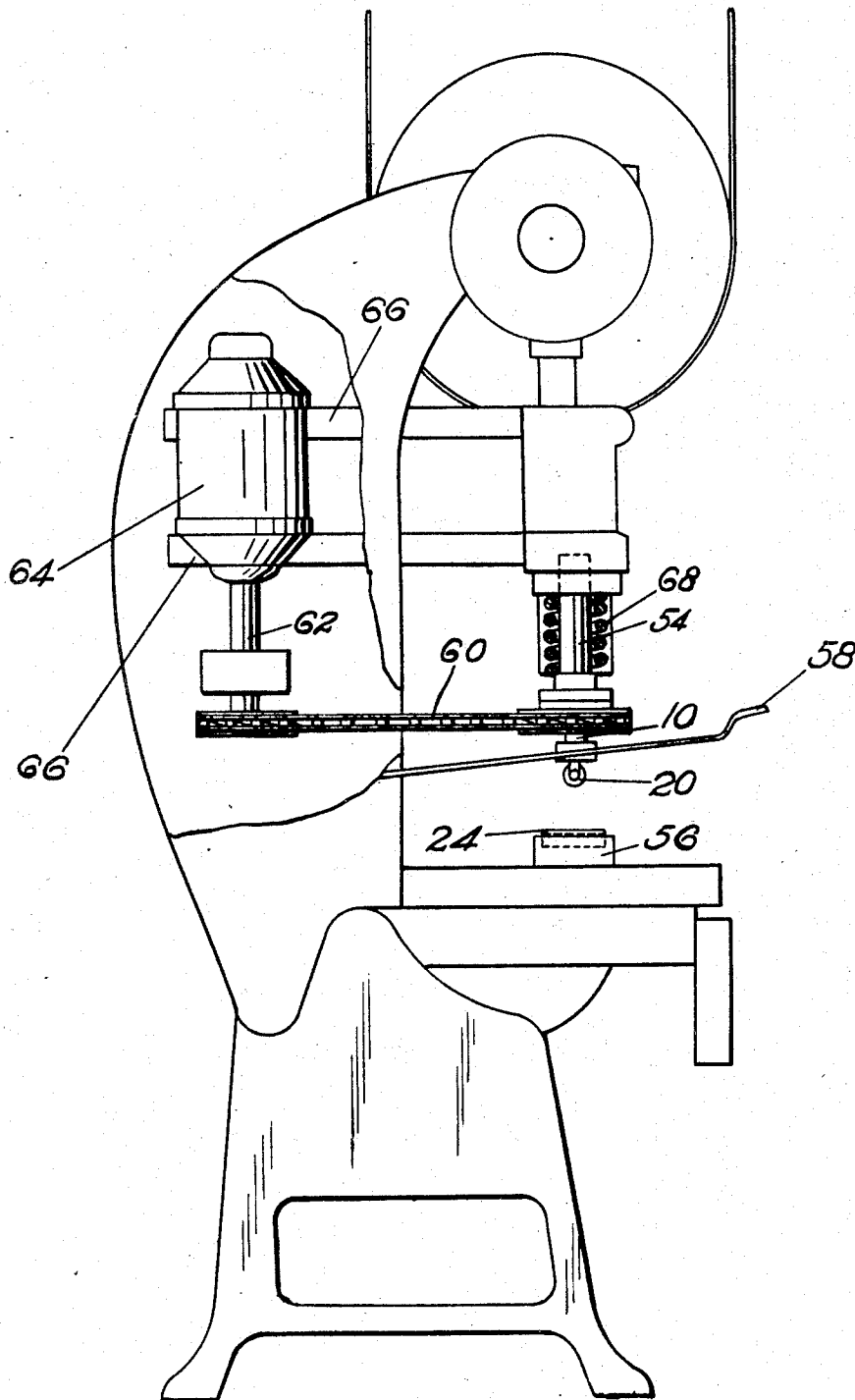


FIG 7

THOMAS O. KOSATKA
INVENTOR

PER

Albert J. Fike

ATTORNEY

Nov. 26, 1940.

T. O. KOSATKA

2,223,324

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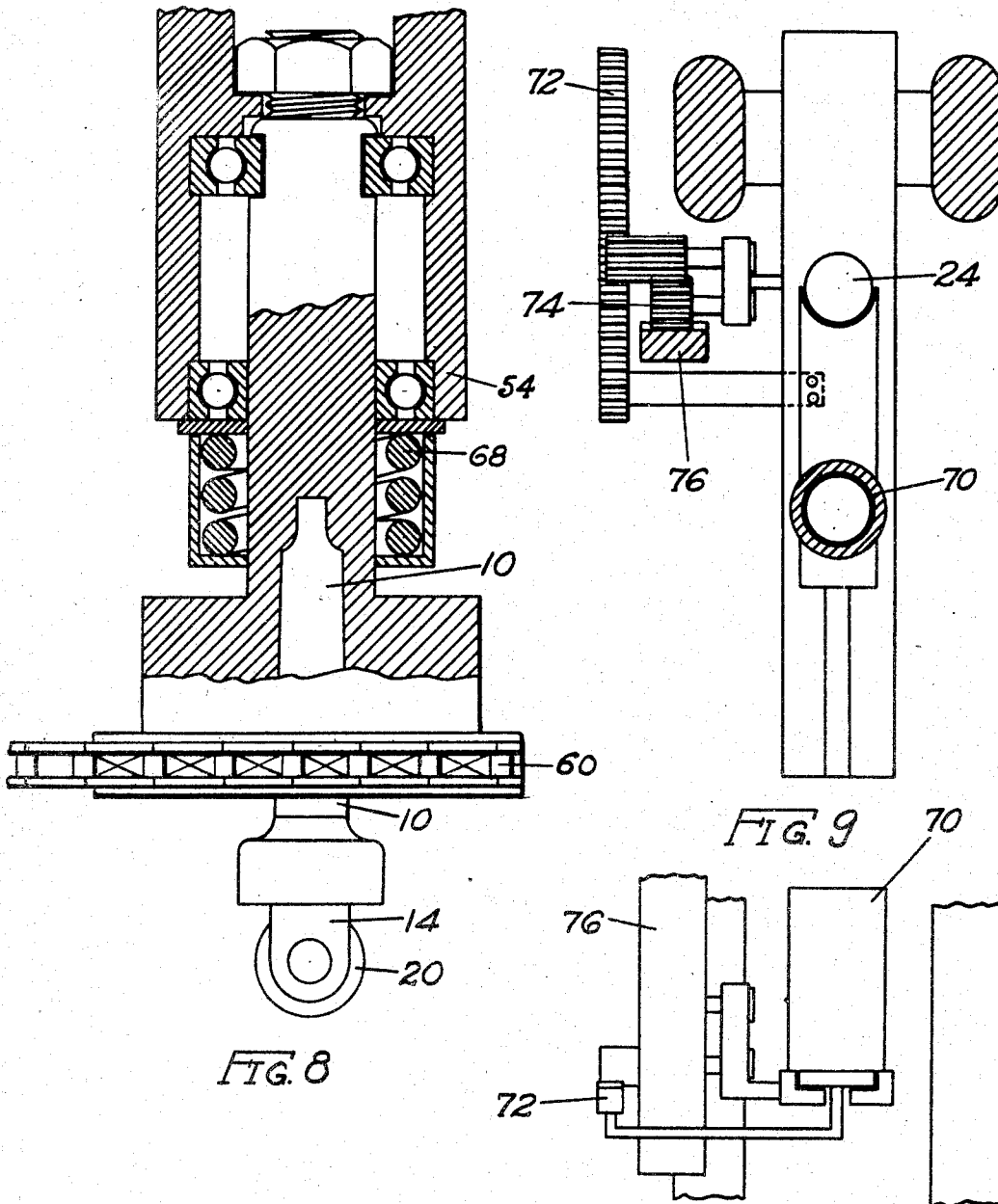


FIG. 8

FIG. 9

FIG. 10

THOMAS O. KOSATKA
INVENTOR

PER

Albert J. Fihe

ATTORNEY

UNITED STATES PATENT OFFICE

2,223,324

CLOSING MEANS FOR METAL SHELLS

Thomas O. Kozatka, Cicero, Ill., assignor to Victor Manufacturing & Gasket Company, Chicago, Ill., a corporation of Illinois

Application October 29, 1938, Serial No. 237,757

2 Claims. (Cl. 113—52)

This invention relates to an improved closing means for metal shells and has, for one of its principal objects, the provision of a simple yet efficient device which will adequately and properly close or spin down the edges of metallic shells, usually about an inner shell, so as to form a complete unitary structure.

One of the important objects of this invention is the provision of a closing means for metallic shells which can be specifically applied to the production of devices known as oil seals or grease retainers, which devices usually comprise a flexible sealing element or diaphragm held in position about a rotatable shaft by means of a containing shell, usually formed of two or more pieces, which shell is then fitted into a housing surrounding a shaft.

One of the important objects of this invention is to provide a closing device for oil seal shells or the like which will automatically compensate for slight irregularities in the shape, size and dimensions of the shells while, at the same time, producing an adequate and liquid-tight seal under practically all circumstances.

Another important object of the invention is to provide a closing device for metal shells, particularly oil seals or grease retainer shells, which can be readily used in conjunction with a drill press and other appurtenances which will render the sealing operation semi-automatic.

A further important object of the invention is the provision of a sealing device for grease retainer shells or oil seals which can be quite readily employed with a punch press and which, by the use and introduction of further appurtenances, will render the sealing or closing operation practically entirely automatic.

Other and further important objects of the invention will be apparent from the disclosures in the accompanying drawings and following specification.

The invention, in a preferred form, is shown in the drawings and hereinafter more fully described.

In the drawings:

Figure 1 is a detail view, partly in section, of the improved sealing device of this invention, showing the same as about to begin an operation upon an oil seal shell also shown in section.

Figure 2 is a sectional view of a representative oil seal shell after having been closed or sealed by the improved device of this invention.

Figure 3 is a side elevation of the sealing device illustrated in Figure 1.

Figure 4 is a view, illustrating a type of auto-

matic feed which may be employed in conjunction with the sealing device of the invention.

Figure 5 is a side elevation, showing the improved sealing device of this invention as mounted on a drill press and also illustrating the employment in conjunction with a drill press of an automatic means for removing the completed devices after the closing operation has been performed.

Figure 6 is a front elevation of a punch press, showing the improved sealing device of this invention applied thereto and adapted to be used therewith.

Figure 7 is a side elevation of the punch press, parts being broken away, showing the same with appurtenances as adapted for the use of the improved sealing device of this invention.

Figure 8 is a detail of the rotatably mounted tool and chuck in the head of the punch press.

Figure 9 is a top plan view of the automatic feeding mechanism as shown in Figure 4.

Figure 10 is a front elevation of the feeding mechanism of Figures 4 and 9.

As shown in the drawings:

The reference numeral 10 indicates generally a stem or support upon which the improved sealing device of this invention is mounted, the same including a platform 12 having slidably positioned therein two depending supports 14, which may be adjusted toward or from each other by means of a hand screw 16.

Each of these supports 14 is bifurcated as shown and includes a shaft 18 upon which is mounted a wheel or roller 20, the rollers having their inner faces beveled as illustrated. Suitable lubricating means 22 is provided for each shaft and roller.

As will be obvious, the oil seal or grease retainer, which generally comprises an outer shell 24 and an inner shell 26 together with a flexible diaphragm or sealing element 28, is preliminarily assembled, the inner shell 26 being simply dropped into the outer shell 24, and the device is then placed under the sealing structure, the same being then depressed, either by hand in a drill press or mechanically as in a punch press, to a predetermined amount so as to bend the upper edges of the outer shell 24 inwardly and down upon the uppermost face of the inner shell 26, producing a completed composite seal as shown in Figure 2.

In employing a drill press such as that shown at 30 in Figure 5, the handle 32 is operated to depress the member 34 which carries the sealing

element and, at the same time, rotates the same by means of the gears 36. This then operates on the oil seal or grease retainer 24 placed in a suitable support 38 mounted on the drill press frame, whereupon the sealing operation is simply and effectively completed.

Attached to the operating handle 32 is an arm 40 having a roller 44 pivotally mounted on its end. This roller is held in position by means of a spring or the like 46 and operates against a trigger 48 connected to a valve 50 in an air line 52.

The construction is such that upon the return of the handle 32 to original position and a consequent upward movement of the element 34 with the sealing device attached, the valve in the air line is suddenly opened and a strong blast of air is directed at the lower portion of the completed seal 24, whereupon it is immediately blown out of its position in the stand 38, and the strength of the blast of air can be so regulated that the completed seal is ejected to such a distance that it will fall into a receptacle provided therefor or otherwise be delivered into a chute which will collect the assembled seals as they are completed.

In Figures 6 and 7, the sealing device 10—20 of this invention is shown as mounted on a punch press whereby the operation can be made still more automatic and also can be controlled to a considerable degree of accuracy.

The device is suitably supported in the ram 54 of the punch press above a support 56 in which incompletes seals 24 are positioned, and the punch press is then released for operation by means of the usual handles 58, there being two of these handles as best shown in Figure 6, which must be operated simultaneously by both hands of the operator so as to insure the absence of the operator's hands from the proximity of the shell 24 when the ram with the sealing device descends.

In order to rotate the sealing device for completion of the shell closing operation, a chain 60 is provided passing around sprockets, one sprocket being mounted on the ram 54 and rotatable with the sealing device and the other sprocket being on the end of the shaft 62 driven by a motor 64 mounted at the rear of the punch press and supported by brackets or extensions 66 which are attached to and move with the punch press ram 54. In this manner, a proper rotation of the sealing device is assured at all times and in all positions, especially when the ram is in its lowermost position, and the closing operation is actually being performed on the shell.

A spring 68 is mounted in the ram 54 surrounding the upper end of the shaft 10 or its support, this spring being strong enough to assure a proper sealing pressure on the elements 20 while, at the same time, allowing of some small relative movement between the closing device 10—20 and the ram 54 itself, thereby automatically compensating for slight irregularities which will inevitably occur in the size of the shells 24 even though the same were made in production and for the same units. Obviously, different sizes of shells can be adequately closed by this device; first, by adjusting the distance between the rollers or wheels 20 and also by adjusting the position of the supporting rod 10 in the punch press ram 54.

An automatic feed may also be provided for the oil seal shells to be closed, this being best illustrated in Figure 4 wherein a plurality of the uncompleted shells 24 may be stacked in a tubular

container 70 which may be mounted on either a punch press or a drill press and which is provided with a slide 72 operated by means of gears 74 and racks 76 connected to either the head of the drill press or the ram of the punch press as indicated at 78 and which carries the closing device 10—20. When this automatic feed is used, the supports 38 and 56, which are employed in hand operation, can be dispensed with as illustrated in Figure 4. The slide 72 simply pushes a shell to be closed forwardly to a position underneath the element 10—20.

It will be obvious that each time the ram ascends, the slide 72 is moved forwardly, thereby pushing the lowermost shell 24 out from under the stack in the tube 70, and the length of the slide and the dimensions of the gears and racks is such that it will be automatically positioned directly beneath the closing device 20, and upon the following downward movement of the ram, the operation will be completed, whereupon the closed shell may be removed by means of a blast of air as illustrated in Figure 5 or by hand, if preferred, while the slide 72 is automatically returned to its original position for another and subsequent shell feeding movement.

It will be obvious that herein is provided a closing device which is particularly adapted for oil seals or grease retainer shells, particularly because of its ease and certainty of operation and also because the closing operation can be effectively regulated, thereby compensating for various discrepancies in the size or construction of the shells themselves, which will unavoidably occur in the production of devices of this type.

Obviously, by the use of the drill press, a proper seal for each individual shell may be adequately assured, depending simply upon the skill and attention of the operator, and the tension of the spring 68, when used with a punch press construction, will also assure the same result. This will also avoid undesirable buckling of the outer shell which has often occurred in sealing operations as heretofore practiced, and which, in addition to tending to produce leakage, also renders the shell itself difficult of installation.

I am aware that many changes may be made and numerous details of construction varied throughout a wide range without departing from the principles of this invention, and I, therefore, do not purpose limiting the patent granted hereon otherwise than as necessitated by the prior art.

I claim as my invention:

1. A closing device for metal shells, comprising a tool head, a pair of rollers mounted in the head, means for simultaneously rotating and depressing the head, said means including a punch press structure, a motor mounted on the ram of the punch press, chain and sprocket connections between the motor and the head, and a spring between the punch press ram and the tool head for automatically compensating for variations in the shells to be closed.

2. A closing device for circular metallic shells, comprising a head, a pair of beveled rollers rotatably mounted in the head, means for adjusting the rollers toward and from each other, means for moving the head and rollers downwardly and simultaneously rotating the same, means for automatically feeding uncompleted shells into position under the head, said means including a receptacle for shells in stacked relationship, a reciprocable slide operating in conjunction with

the receptacle for removing the lowermost shell from the stack upon a forward motion, means for reciprocating the slide, said means comprising a geared rack connected to the head moving element, and another geared rack being parallel with and connected to the slide, and gears be-

tween the two racks whereby motion is transmitted from the rack connected to the head moving element to the rack parallel with and connected to the slide.

THOMAS O. KOSATKA.