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METAL STOCK OILER

2,614,526

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2 SHEETS—SHEET 1

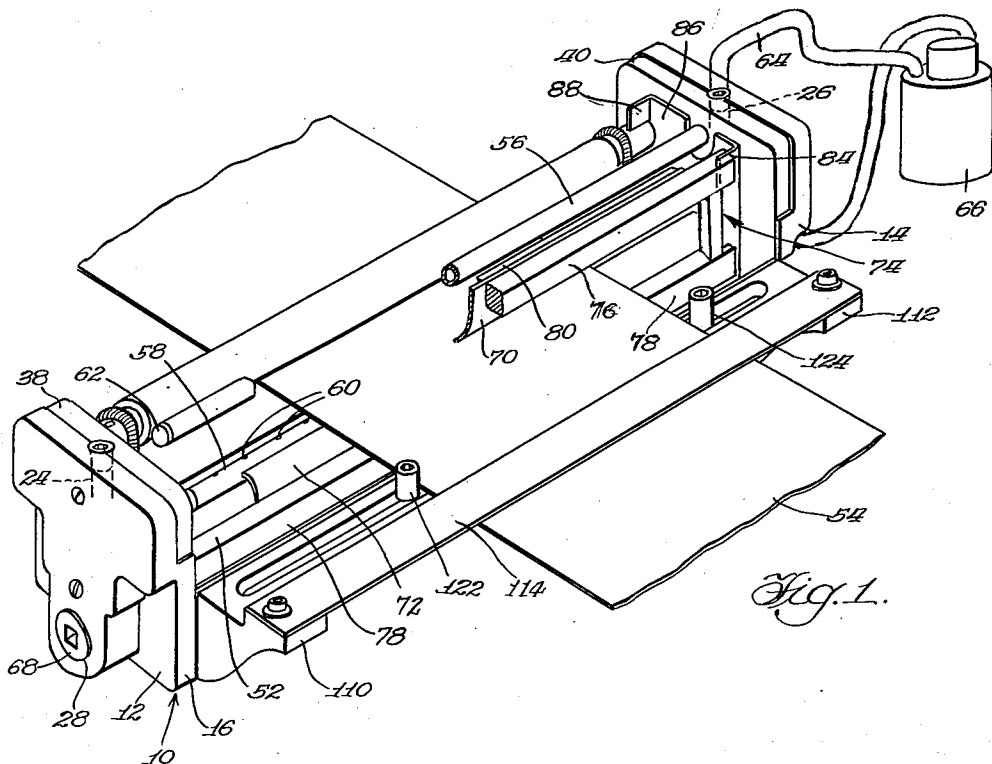


Fig. 1.

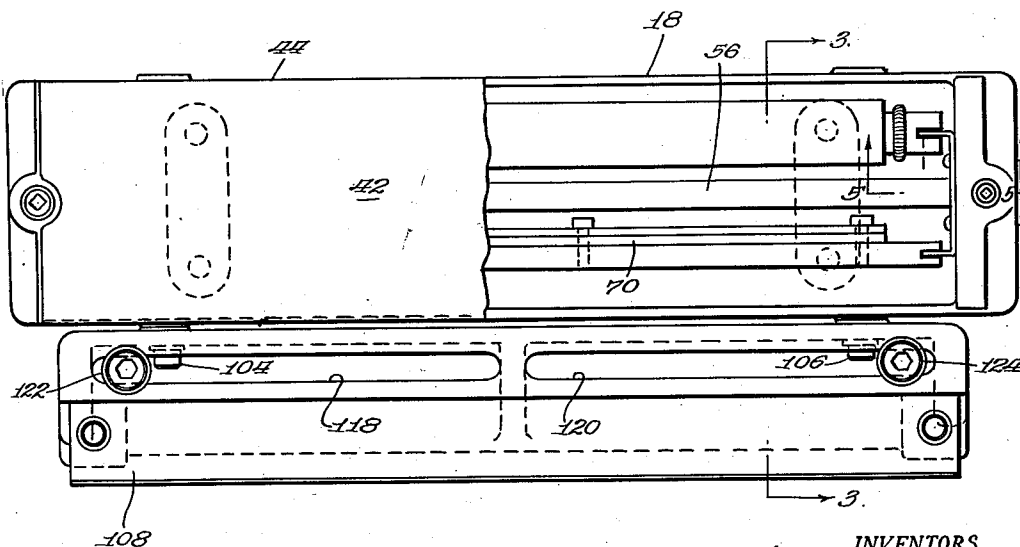


Fig. 2.

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2 SHEETS—SHEET 2

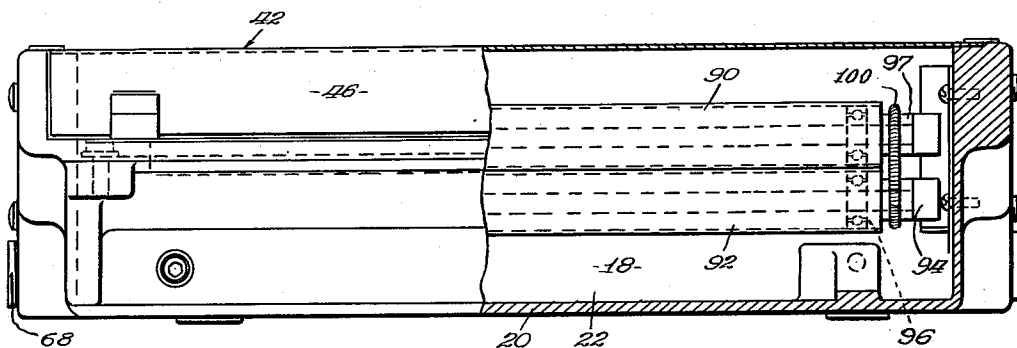


Fig. 4.

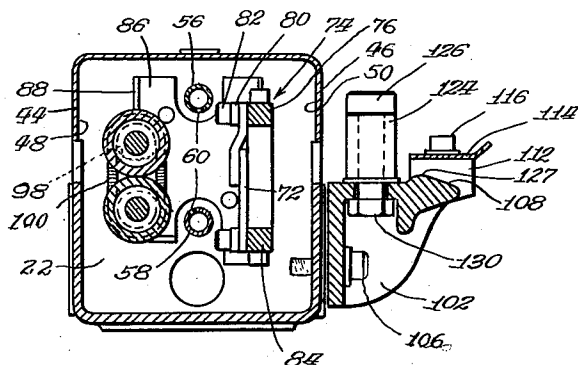


Fig. 3.

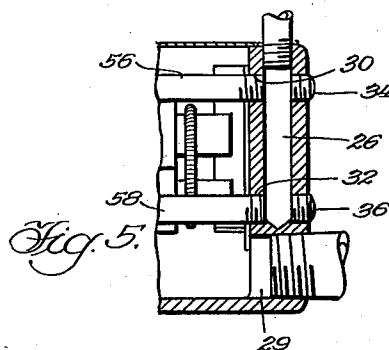


Fig. 5.

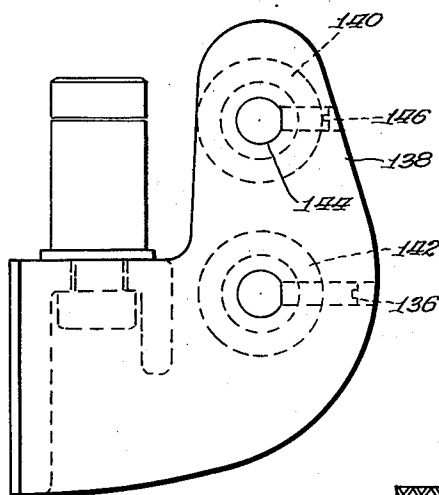


Fig. 7.

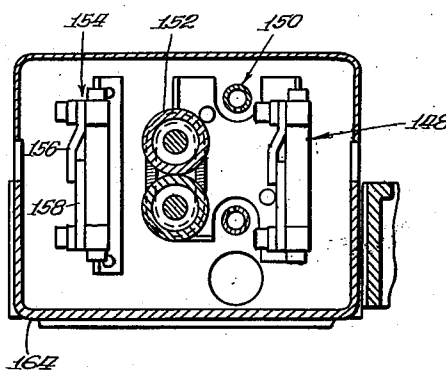
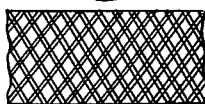


Fig. 6.

Fig. 8.



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METAL STOCK OILER

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8 Claims. (Cl. 118—122)

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This invention relates to an improved stock oiler. A stock oiler is a device for applying a film of lubricant to both surfaces of a metal sheet immediately before a punching or a shaping operation is performed, usually by a punch press. The oiler is mounted immediately adjacent the bed of the punch press and the stock is fed through the oiler into the feeding elements of the press.

The first object of this invention is to provide an oiler capable of handling lubricants of widely varying viscosities. Existing oilers utilize a drip pot for applying lubricant to the upper surface of the stock and a felt roll operating in a sump applying lubricant to the lower surface of the stock. This construction will not provide an even distribution of oils of high viscosity, that is, oils that do not flow freely. This deficiency greatly impairs their usefulness because in many drawing and forming operations, and in a few piercing and punching operations, machinists use very heavy oils in order to lengthen the life of their dies. At the present time, many of these heavy oils are manually applied to the surface of the stock by a brush.

Applicants obtain their objective firstly by applying the oil under pressure to the stock surface. Applicants' oiler consists of a sump, an upper tube and a lower tube, each having perforations therein for spraying lubricant on both sides of the stock, and a pump for forcing the lubricant out the apertures. The tubes are quickly disassembled so that it is possible to provide the user with a plurality of tubes having different sized apertures to handle lubricants of different viscosities.

The second object of this invention is to provide an oiler that can apply various thicknesses of lubricant film to the stock. All lubricant applied to stock must subsequently be removed. The more lubricant on the stock, the more expensive the degreasing step, and the more oil that is lost. Machinists, therefore, wish to apply the minimum thickness of lubricant film consistent with a maximum preservation of the dies. Applicants apply a surplussage of lubricant to the stock, but in place of simply placing the stock between the surface of the same felt or rubber rollers which leaves much the same thickness of film irrespective of the pressure on the rolls or the viscosity of the lubricant, applicants provide the user with a plurality of sets of rollers, some metal, some rubber, which have the ability to pass different amounts of lubricant. Applicants' oiler is so designed that one set of rolls can be

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substituted for another set in a matter of seconds. Substitution of one set of applicants' rollers for another involves no knock-down time and does not justify a punch press operator's showing such time on his time card. The feature of applicants' invention which attains this object is the mounting of rollers on shafts having slotted ends which seat in vertical ways, open at the top, so that a pair of rollers can be lifted out and another pair quickly substituted.

This mounting feature of rollers is also employed for certain wiper and baffle blades and carries out a third object of applicants' invention. This object is to provide a mounting which may be used for various devices for working on the surface of stock. The present device consists of three or four stages, namely, a baffle stage, a spraying stage, and a roller stage, shown in one embodiment, and a wiper stage, shown in a second embodiment. Applicants are contemplating a stock cleaner which will probably be a separate unit, but may be incorporated into the oiler. Stock, at the time of use, is in various states of cleanliness, depending upon how stored and for what period of time. If it is very dirty, it is desirable to clean it in order to further protect the dies. Additionally, some stock, such as copper sheets, may be treated with a protective film by the mill that rolled the copper. Machinists frequently want this film removed before performing punching or drawing operations. A cleaning operation necessarily depends upon the nature of the film. A solvent may be used to wash the film off, or in some cases, such as dirt, it may be brushed off. Applicants' mounting enables them to substitute brushes or rollers for wipers and baffles and where desirable, to employ the spray.

Another object of this invention is to provide an oiler whose sump may be quickly cleaned. A certain amount of foreign ingredients coming off the stock will collect in the sump. Applicants' system being one which circulates the oil, some of this material will be carried to the pump assembly which has incorporated into it settling tanks so that substantially clean lubricant will return to the oiler. However, some of the material will collect in the sump of the oiler, and a feature of applicants' invention is not only the ready removal of rollers, baffles and wipers, but the removal of the spray tubes so that the sump is open and may be quickly cleaned.

Another object of this invention is to provide an upper guide for controlling, primarily, the flapping of the end of stock drawn from a spool

or roll. In the best present practice, stock is fed through straightening rolls so that it is substantially flat as it reaches the bed of the press. Very commonly, however, such rolls are not employed and the stock as it enters the oiler may have waves in it which become more marked as stock coming from the small diameter of the roll is used. The end is particularly bothersome. In applicants' device, where the baffles, wipers and rolls float to promote quick removability, the waves in the stock can be troublesome and applicants provide a top bar above their feed ledge which resists waving of the stock so as to hold it straighter as it moves through the oiler to the feed rolls or fingers on the press.

Applicants' design includes several construction features which will appear in the description that follows. Applicants' commercial oiler is illustrated in Figs. 1 through 5 of the accompanying drawings. Another embodiment of the invention employing wiper blades is illustrated in one view. An alternative horizontal guide is also illustrated. Referring to the drawings:

Fig. 1 is a perspective view partly cut away illustrating applicants' commercial oiler and pump assembly with a piece of stock being fed therethrough;

Fig. 2 is a plan view of the oiler with the lid partly cut away;

Fig. 3 is a transverse sectional view taken on the line 3—3 of Fig. 2;

Fig. 4 is a side elevation with portions of the cover and front feed table partly cut away;

Fig. 5 is a sectional view of one end of the oiler taken on the line 5—5 of Fig. 2;

Fig. 6 is a sectional view of an oiler having a pair of wiper blades mounted therein;

Fig. 7 is a side elevation of a roller-type horizontal guide which may be substituted for the fixed horizontal guide shown in Figs. 1 through 5; and,

Fig. 8 is a front elevation of a portion of a knurled steel roll.

Continuing to refer to the drawings, particularly Figures 1 and 2, the numeral 10 identifies an aluminum casting having spaced end walls 12 and 14, side walls 16 and 18, and bottom 20, which together form a sump 22. Vertical passageways 24 and 26 are formed in end walls 12 and 14 at their midpoint. Drain outlets 28 and 29 are formed in the lower portion of the ends 12 and 14, and as illustrated in Fig. 5, these drains are not in communication with the vertical passageways such as 26. Transverse inlets such as 30 and 32 are drilled and threaded in each end wall so that they pass through the vertical passageways such as 26, see Fig. 5. Slotted pipe-plugs 34 and 36 close the outer ends of the transverse inlets 30 and 32.

The casting 10 has recessed shoulders 38 and 40 on the inside top and side portion of each end so that a cover 42, not shown in Fig. 1, but shown in Figs. 2 and 4, may be dropped into position and held against lateral movement. This cover 42 has side walls 44 and 46 which may be spaced by a distance slightly less than the distance between the walls 48 and 50 of the shoulders such as 40, referring to Fig. 1, so that the cover 42 being made of elastic material can be snapped down on these walls 48 and 50 and held tightly in position. The side walls of the cover terminate about one-half inch above the ledge 52 and stock is fed through this opening.

Two spaced tubes 56 and 58 called sprayers have ports such as 60 and are threadedly mounted in either end of the casting. As shown in Fig. 1,

they are mounted in the end wall 14 in the inlet ports 30 and 32, see Fig. 5. Each tube carries an end cap 62. The user mounts the tubes in communication with whichever passageway 24 or 26 is most convenient for attaching a flexible hose 64 leading to the high side of a pump assembly 66. Thus, if he attaches the tubes to the passageway 26 as shown in Fig. 1, the passageway 24 is not used, and if he attaches the tubes to passageway 24, the passageway 26 is not used. The same practice is followed in the case of the drains 28 and 29, but in the case of the unused drain, a plug such as 68, in Fig. 4, is employed.

In order to confine lubricant within the device, applicants provide a pair of baffles 70 and 72. Referring to Figs. 1 and 2, both of these baffles are mounted on a rectangular frame 74, the upper baffle 70 being attached to the top transverse member 76 by a gripper strip 80 and bolts 82, and the lower baffle 72 by similar members to the lower transverse member 78. Each end of the upper and lower transverse members 76 and 78 is vertically slotted to form ways which ride on a flange or guide 84, formed on a plate 86 fastened to the inside of the end wall. This baffle frame is free to move up and down with such changes in height of the stock 54 as may occur while it passes through the oiler.

The plate 86 carries a similar flange 88 which acts as a guide for the roller assembly. Referring to Fig. 4, two rollers 90 and 92 are each mounted on a shaft by means of a roller bearing assembly 96. Each end of each shaft carries a head 94 which is mounted on the shaft by any suitable means, and this head is vertically slotted to seat in the way or guide 88. Disposed between the head 94 and the roller bearing assembly is a bushing 97 which carries an annular groove 98. Riding in the annular grooves 98 is a helical spring 100 which urges the two rollers into engagement with each other.

Referring to Fig. 3, 102 identifies a casting that acts as a horizontal guide. This casting is fastened to the casting 10 by bolts such as 104 and 106, see Fig. 2. The casting has a horizontal feed lip 108, see Figs. 1 and 3, at either end of which is a raised portion 110 and 112. Spanning the distance between the raised portions 110 and 112 is an upper guide plate 114 tightly fastened to the portions 110 and 112 by bolts such as 116.

Between the feed lip and the main body of the oiler, there are a pair of aligned slots 118 and 120, see Fig. 2, which act as ways for adjustable vertical guide rollers 122 and 124. These guide rollers may be formed in various ways. As illustrated in Fig. 3, each consists of a bolt 126 having a head and carrying a roller 124 which is free to turn on the bolt. The bolt 126 has a threaded bushing 127 which is seated on the top of the feed lip 108 by tightening the nut 130 which thereby fixes the roller in its desired position.

It will be observed that the apertures in the lower tube 58 are directed at an angle of about 45 degrees toward the rollers, whereas the apertures of the upper tube 56 are directed vertically downwardly. The lower roller 92 is in the sump so that in using lubricants of very heavy viscosity where the pump is unable to throw the oil from the lower tube 58 onto the rollers, the level of the fluid in the sump may be raised so that the lower roller is partially submerged. This is effected by coupling an elbow having an arm ex-

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tending upwardly to a point above the bottom of the lower roller 92 to the drain.

In Fig. 7, there is illustrated a roller-type horizontal guide. Here, the casting has a pair of end arms such as 138 between which are mounted rollers 140 and 142. These rollers are mounted on shafts which seat in journals such as 144. The shafts may be held against rotation by set screws such as 146.

A second embodiment of the invention is shown in Fig. 6. Here a baffle assembly 148, sprayers 150 and rollers 152 are the same as the assembly heretofore described, but an additional rectangular frame 154 carrying blades 156 and 158 is employed. These blades 156 and 158 are employed as wipers for spreading and removing lubricant from the stock. In this embodiment, the casting 164 forming the sump has been suitably enlarged.

In addition to supplying a user with rubber or synthetic rollers of varying degrees of hardness, applicants supply knurled, metal rollers in which the knurls are variously spaced and the grooves between them of various depths. A portion of the face of one of these rollers is shown in Fig. 8. The lower the tension on the rollers and the greater the depth of the grooves, the thicker the film of lubricant on the surface of the work.

Having thus described our invention, what we claim is:

1. A stock oiler for use in a circulating liquid system comprising a sump, guides for directing the stock with its surfaces substantially horizontal over the sump along a selected path, liquid applicators positioned above and below said path, vertical guideways mounted on opposite inside walls of the sump, a means for treating the surface of stock, one of said means mounted above said path and the other mounted therebelow, and slides mounted on opposite ends of each of said surface-treating means seatable on said guideways for free vertical movement therein so that each of said surface-treating means is free to move upwardly and downwardly independently of each other, and a contraction spring means mounted between the upper and lower surface-treating means and urging them together.

2. A stock oiler for use in a circulating liquid system comprising a sump, guides for directing the stock with its surfaces substantially horizontal over the sump along a selected path, liquid applicators positioned above and below said path, a plate having outwardly directed vertical flanges mounted on the inside of each of two opposite walls of the sump so that the flanges are in transverse alignment, a pair of rollers mounted on shafts having straight end slots seated in one pair of aligned flanges, and a pair of flexible baffles mounted on a frame having side slots seated on the other pair of aligned flanges.

3. A stock oiler for use in a circulating liquid system comprising a sump, guides for directing the stock with its surfaces substantially horizontal over the sump along a selected path, liquid applicators positioned above and below said path, a wiper having a depending straight lower edge for wiping the top surface of the stock mounted above and transversely to the path behind the liquid applicators, a second wiper having an upwardly directed top straight edge for wiping the lower surface of the stock mounted below and transversely to the path behind the liquid applicators, and a pair of flexible baffles having overlapped straight edges mounted in advance

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of the liquid applicators, with the overlapped edges in and transverse to the path, one baffle being mounted above the path and the other baffle being mounted therebelow.

4. A stock oiler for use in a circulating liquid system comprising a casting having a bottom, two end walls, and side walls extending upwardly to a point spaced below the top of the end walls and together forming a sump, the top edges of the side walls being straight and parallel to each other and constituting supports for strip stock to be fed across the sump along a path, a passageway drilled in an end wall, openings into the passageway through the inside surface of the end wall, one opening above the level of the path and the other therebelow, a tube extending toward the other end wall mounted in each opening, and apertures in each tube wall directed toward the path.

5. A stock oiler for use in a circulating liquid system comprising a casting having a bottom, two end walls, and side walls extending upwardly to a point spaced below the top of the end walls and together forming a sump, the top edges of the side walls being straight and parallel to each other and constituting supports for strip stock to be fed across the sump along a path, a passageway drilled in an end wall, an opening into the passageway through the inside surface of the end wall, a tube extending toward the other end wall mounted in the opening, apertures in the tube wall directed toward the path, an angle iron vertically fastened to the inside surface of each end wall with their projecting flanges in transverse vertical alignment with each other, a vertically positioned rectangular frame, an outwardly directed vertical slot in each end of the frame and positioned on a projecting flange so that the stock path passes through the frame, and apparatus for treating the surface of stock mounted on the frame.

6. A stock oiler for use in a circulating liquid system comprising a casting having a bottom, two end walls, and side walls extending upwardly to a point spaced below the top of the end walls and together forming a sump, the top edges of the side walls being straight and parallel to each other and constituting supports for strip stock to be fed across the sump along a path, a passageway drilled in an end wall, an opening into the passageway through the inside surface of the end wall, a tube extending toward the other end wall mounted in the opening, apertures in the tube wall directed toward the path, an angle iron vertically fastened to the inside surface of each end wall with their projecting flanges in transverse vertical alignment with each other, a vertically positioned rectangular frame, an outwardly directed vertical slot in each end of the frame and positioned on a projecting flange so that the stock path passes through the frame, apparatus for treating the surface of stock mounted on said frame, a second angle iron vertically fastened to the inside surface of each end wall with their projecting flanges in transverse alignment with each other, and a pair of rollers mounted on shafts having straight end slots seated in the latter aligned flanges.

7. A stock oiler for use in a circulating liquid system comprising a sump, guides for directing the stock with its surfaces substantially horizontal over the sump along a selected path, liquid applicators positioned above and below said path, a plate having an outwardly directed vertical

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flange mounted on the inside of each of the two opposite end walls of the sump so that the flanges are in transverse alignment, apparatus for treating the surface of stock disposed adjacent said horizontal path, and slides mounted on each end of said apparatus in slideable engagement with an associated vertical flange.

8. A stock oiler for use in a circulating liquid system comprising a sump, guides for directing the stock with its surfaces substantially horizontal over the sump along a selected path, liquid applicators positioned below and above said path, vertical guideways mounted on opposite inside walls of the sump, a roller for treating the surface of the stock mounted above the path and a second roller mounted below the path, the two rollers being on parallel horizontal shafts, a slide mounted on the end of each shaft and seated in an associated guideway so that the two rollers are free to move vertically independently of each

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other, and an elastic belt over the two shafts at each end of the rollers urging them toward each other.

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REFERENCES CITED

The following references are of record in the file of this patent:

UNITED STATES PATENTS

Number	Name	Date
1,652,697	Boettger	Dec. 13, 1927
1,756,998	Walker	May 6, 1930
2,348,698	Thompson	May 9, 1944
2,356,666	Hamilton	Aug. 22, 1944
2,373,432	Tanner	Apr. 10, 1945
2,381,183	Richards	Aug. 7, 1945
2,419,132	Friedman	Apr. 15, 1947
2,421,610	Gordon	June 3, 1947