

Nov. 18, 1969

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3,478,709

SEWING MACHINE

Filed Nov. 17, 1966

4 Sheets-Sheet 1

FIG. 1

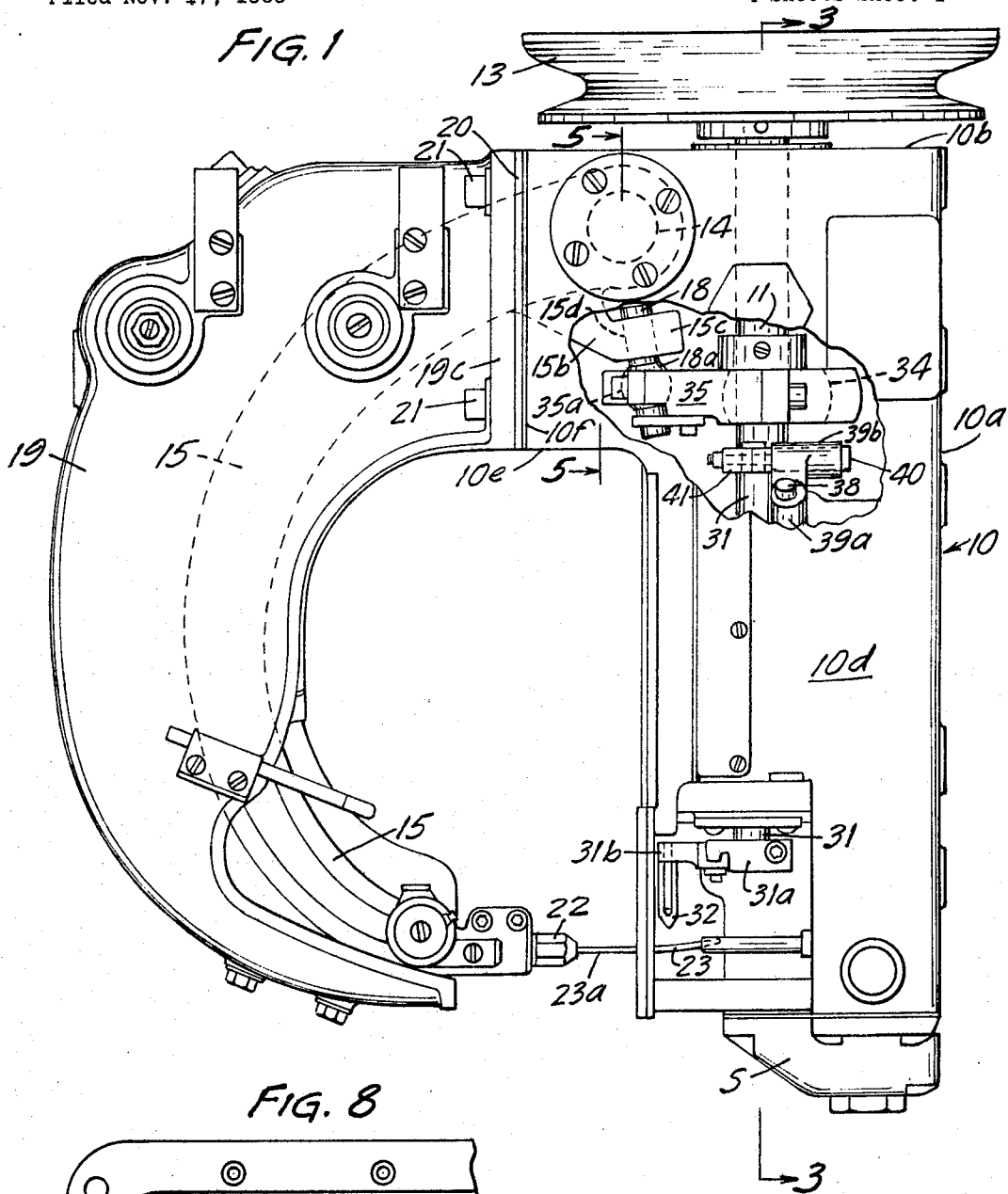
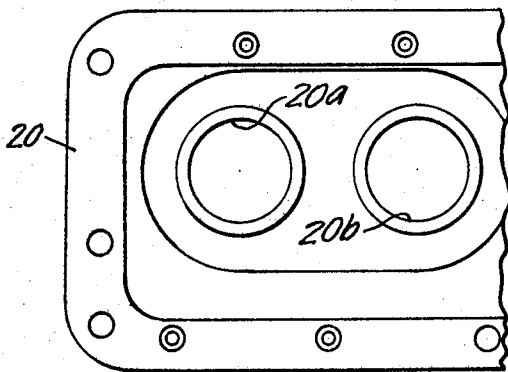


FIG. 8



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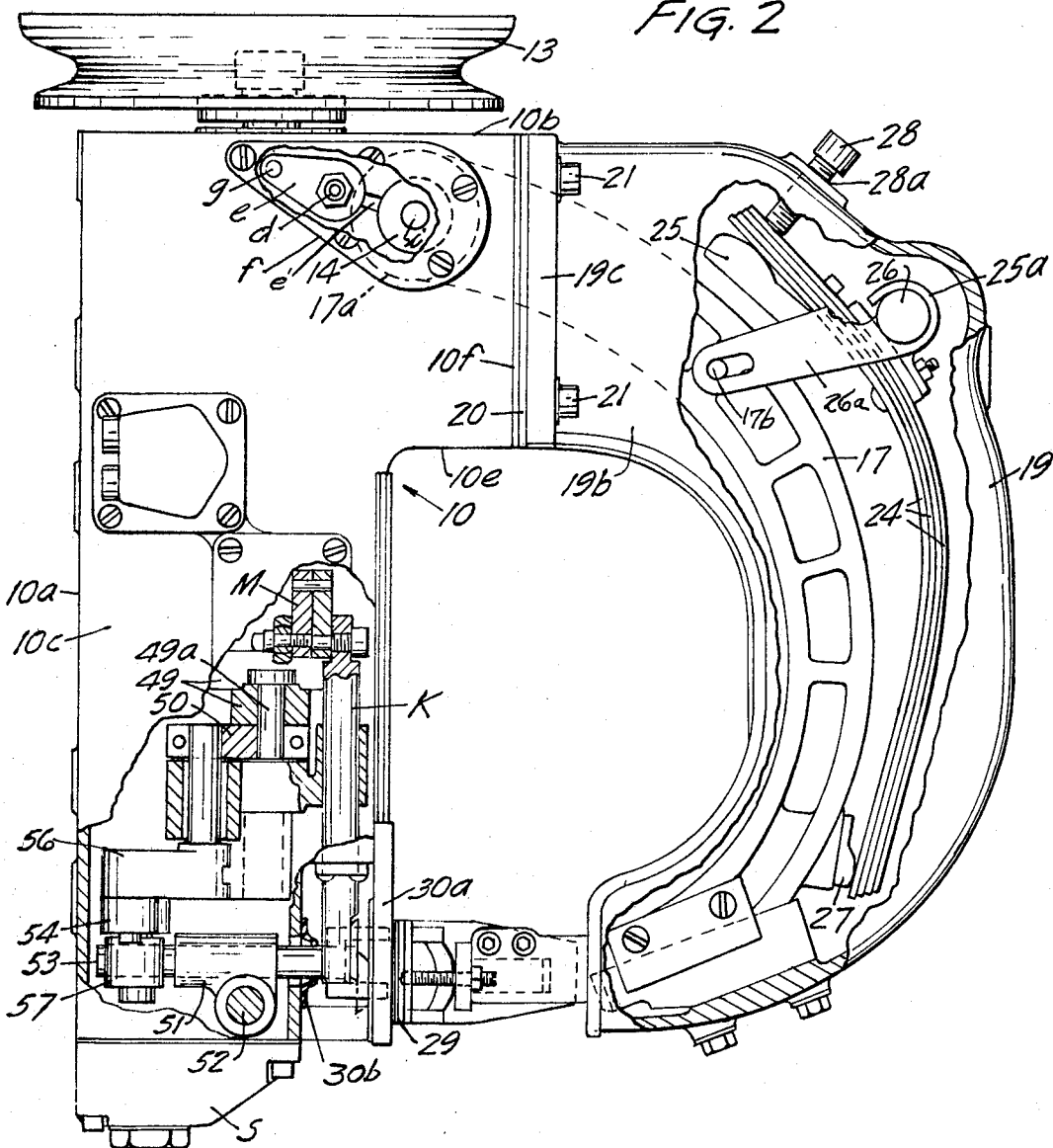
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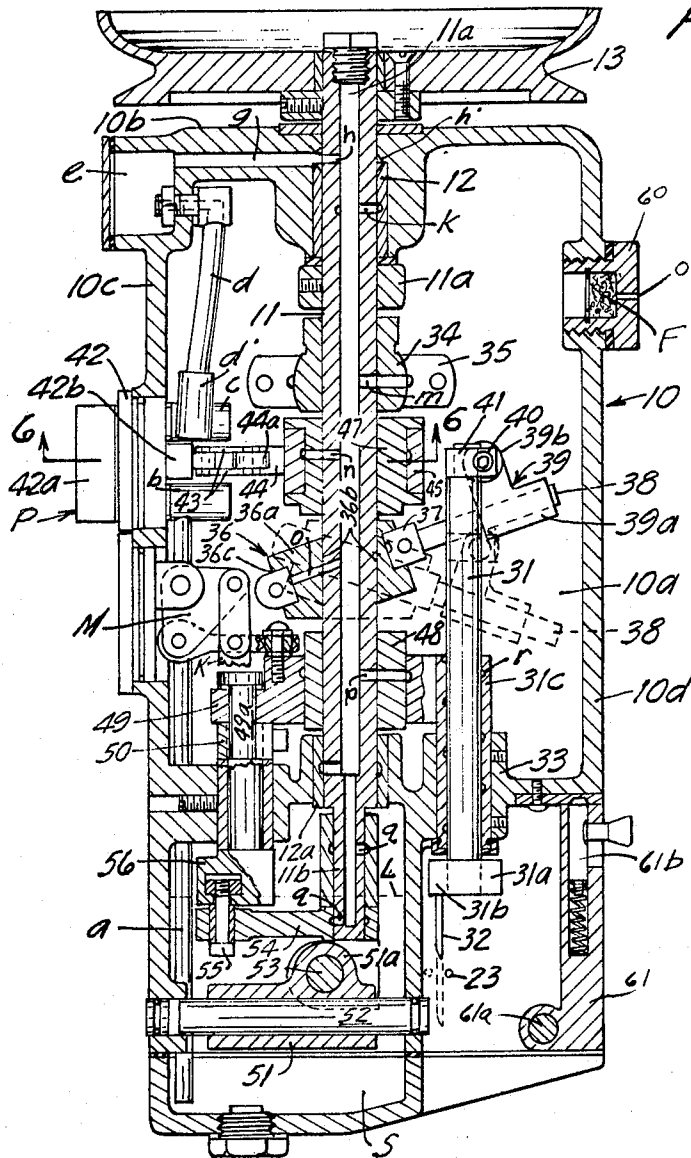


FIG. 3

FIG. 7

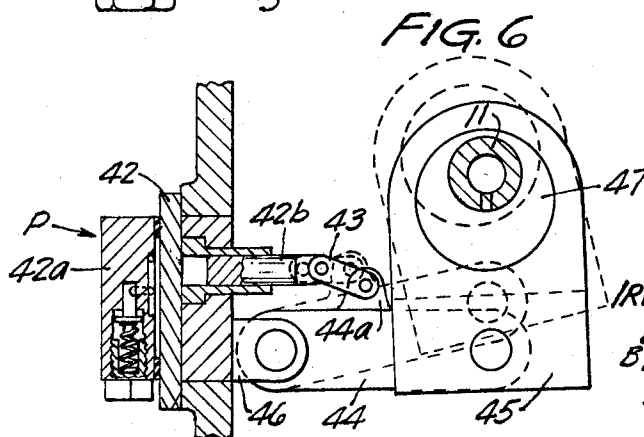
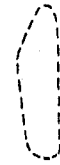


FIG. 6

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FIG. 4

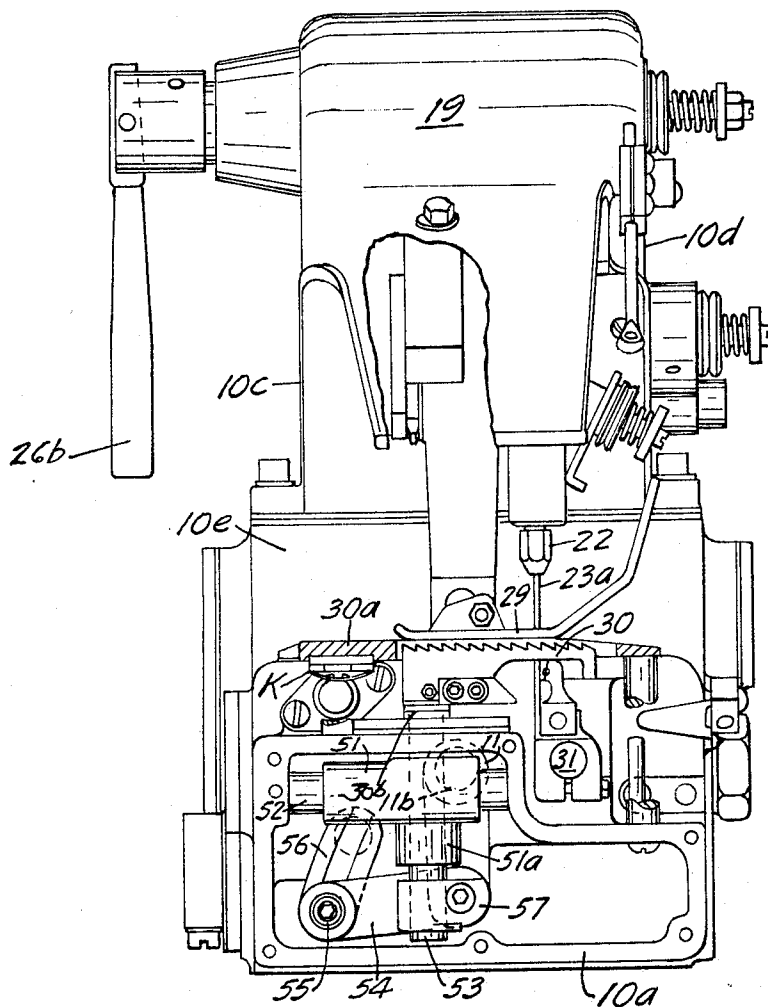
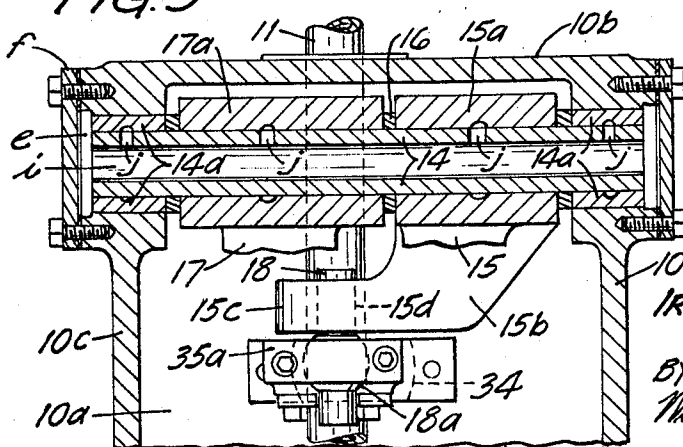


FIG. 5



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SEWING MACHINE

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9 Claims

ABSTRACT OF THE DISCLOSURE

A sewing machine particularly adapted for closing bags and sacks which has the several actuating mechanisms for needle, looper, feed-dog and the like very compactly mounted within a substantially sealed multi-part casing and wherein positive pump-actuated lubricating mechanism is employed to constantly lubricate all working parts, bearings and actuating connections, the construction and mounting of actuating elements for the most part on a common drive shaft disposed in the said housing and this drive shaft has an axial bore which is utilized in the lubricating system as a channel with communication radially to the greater number of actuating parts and bearings. The invention is further characterized by a new and improved looper operating mechanism which involves a minimum number of parts and which is particularly well related to the positive pump-actuated lubricating system.

This invention relates to power driven sewing machines and is particularly adapted for stitching and closing sacks and bags. Many types of such machines, both portable and stationary are well known in the prior art, usually producing a chain stitch of either the single thread or double thread variety.

The stationary machines in the prior art often operate in conjunction with an endless conveyor or other carrier line disposed at one side of the machine and upon which filled bags or sacks are vertically disposed for successive stitching of the upstanding edges thereof.

Machines of the prior art, particularly the stationary type, have been heavy and cumbersome. The mechanisms for driving and synchronizing the essential cooperating stitching components including the looper, the needle, the material feeding mechanism and stitch cut-off mechanism heretofore required an unnecessary multiplicity of parts and mountings for the same. With such multiplicity of parts continued lubrication of the many bearing surfaces is requisite but has not heretofore been accomplished.

Lubrication of the bearings and pivotal connections of the essential cooperating elements of the machine have for the most part been manual, applying the lubrication from time to time through fittings disposed in various spaced parts of the machine. We know of no prior art wherein all of the bearings for the essential driving connections, linkages and the like has been accomplished continuously and automatically during operation of the machine.

It is an object of the present invention to provide a simplified, efficient sewing machine of the class described wherein the driving mechanisms for the needle, the looper, the material moving means are mounted in related and very compact formation within a unitary housing, and wherein sealed provision for automatic lubrication of all bearing surfaces for all essential working parts is accomplished with the supply of lubricant contained within the same housing.

In further contrast to the prior art, the same sealed housing for the respective driving mechanisms and linkage of the essential related sewing machine elements ex-

cludes dust, lint and other foreign material which has heretofore been prevalent in the prior art machines, causing frequent repair and cleaning of bearing surfaces and closely working driving linkage.

A more specific object of our invention is the provision of an improved simplified machine of the general class described wherein a unitary housing is provided for the power takeoff elements from a main shaft and wherein all bearing surfaces for at least the essential drives for the looper, the work moving means and the needle arm are confined and constantly lubricated through a pumping and communication system having its reservoirs disposed within the confines of the enclosing sealed housing, and wherein some phases of the constant lubrication are obtained through splash action and immersion of working parts in the lubricant.

Another object is the provision for use in conventional sewing machine structures of a substantially simplified and compactly arranged looper driving mechanism for simultaneously reciprocating and slightly oscillating the looper shaft and which simplified construction lends itself particularly to a sealed-in lubrication system of the class described.

These and other objects and advantages of the invention will be more apparent from the following description made in conjunction with the accompanying drawings, in which:

FIG. 1 is a side elevation of an embodiment of the invention with a portion of the main housing structure broken away to show working parts therewithin;

FIG. 2 is a side elevation taken from the opposite side of said embodiment with the portion of the two housings broken away to show working parts and driving mechanism therewithin;

FIG. 3 is a vertical section taken substantially along the line 3—3 of FIG. 1;

FIG. 4 is a bottom elevational view looking upwardly with the sump or bottom of the main housing removed;

FIG. 5 is a detail cross sectional view taken substantially along the line 5—5 of FIG. 1, showing the hollow top cross shaft upon which the needle lever arm and presser foot arm are pivotally mounted;

FIG. 6 is a detail horizontal section taken substantially on the line 6—6 of FIG. 3, and showing the driving connections for operating the lubricating pump;

FIG. 7 is a diagrammatic view showing the path of travel of the tip of the looper element during a cycle of operation; and

FIG. 8 is a partial rear elevation of boot-equipped gasket for sealing an upper opening in the main housing through which the needle lever and presser arm extend.

Referring now in detail to the drawings, a vertical inverted L-shaped box type mounting housing 10 is provided having a substantially continuous vertical rear wall 10c, a top wall 10b, and continuous inverted L-shaped side walls 10c and 10d respectively. The bottom of the housing is closed and sealed by a removable oil sump S equipped with a gasket 10g.

The upper portion of main housing 10 overhangs the lower portion of the bottom of the overhang being defined by a horizontal wall 10e. The forward end of the upper portion of the housing is rectangular in shape, leaving a large opening for accommodation of the needle lever and presser foot arm later to be described.

A metal reinforced gasket 20 carrying bossed boots or sleeves 20a and 20b respectively for snugly surrounding the upper portions of the needle lever and presser arm seals this opening with the flange 10f at the upper forward portion of the housing. This gasket is constructed of such material as neoprene or the like having the requisite flexibility and elasticity. As shown, the central and elliptical portion of the body is offset outwardly and for-

wardly from the body proper to facilitate requisite flexibility in boot action.

Substantially centrally disposed relative to the upper portion of housing 10 is a vertical main shaft 11 of tubular construction revolubly mounted in a bearing 12 at the upper end of the housing and in a suitable bearing 12a at the lower end of the housing. Main shaft 11 as shown, has suitably affixed to the top end a belt pulley 13 or other torque-receiving element and is adapted to be connected with a source of rotary power such as a motor or equivalent (not shown). A collar 11a is secured by suitable means to the upper portion of shaft 11 below the bearing 12. The bore 11x of tubular shaft 11, as will later be seen, is an important manifold for our lubricating system.

It is an important feature of this invention that all of the cooperating working parts for the entire sewing machine including needle, looper, material-moving means and automatic stitch-cutting means, as well as a pump constituting an important part of the novel lubricating system are driven from this one vertical shaft 12.

Revolubly mounted in a suitable bearing 14a within the upper portion of main housing 10 is a horizontal tubular cross shaft 14 having its axis parallel to the front of the machine (see particularly FIG. 5). At the right hand portion of said shaft looking towards the machine the hub 15a of an elongated and curved needle arm 15 is affixed, spaced from the hub 17a of an elongated and similarly curved presser foot arm 17 as by means of a thrust washer 16. Arm 17 is rotatably mounted on shaft 14. Needle lever 15 affixed to cross shaft 14 has a short actuated arm 15b disposed below and eccentrically of its hub 15a, said arm 15b terminating in a horizontal, thick disc 15c which has a vertical bore 15d for receiving an upstanding actuating pin 18 (see FIG. 5), later to be described.

The curved needle lever 15 and curved presser foot arm 17 work side-by-side in closely spaced relation and a common guard housing 19 of curved hollow construction surrounds all but the terminal portions of said needle lever and presser foot arm having a rectangular upper end 19b which is flanged at 19c for attachment to and support from the widened flange 10f of the upper portion of housing 10, said boot gasket 20 being inserted therebetween and the said two flanges being clamped together by a plurality of bolts 21. The two boot sleeves 22a and 22b snugly surround and seal against the upper portions respectively of presser bar 17 and needle lever 15.

At the lower end of needle lever 15 (see FIG. 1) a chuck element 22 is mounted for clamping and supporting the shank 23a of a needle 23.

The curved presser arm is backed for adjustable pressure by a series of curved leaf springs 24 which extend symmetrically within the curved guard or frame housing 19 having secured adjacent their upper ends a wear plate which has a retaining or strap portion 25a pivotally mounted on a cross shaft 26 (see FIG. 2). A contact plate 27 is affixed near the lower end of presser foot arm 17 having an enlarged lower portion which is engaged by the springs 24. The upper ends of the springs 24 are adjustably engaged at their forward sides by an adjustment screw 28 which is threaded in a tapped socket 28a formed near the upper end of the guard housing.

Leaf springs 24 are preformed in curved shape so that normally tension and pressure are imparted to the contact plate 27 affixed to the lower portion of presser arm 17. Pressure to urge the presser foot arm 17 inwardly against the work piece may be adjusted through the screw 28. Thus when the screw is loosened, less pressure will be applied.

Cooperating with the presser foot 29 is a feed dog 30 (see FIGS. 4 and 2) which is driven in gyratory fashion through an elongated ellipse travel to move the bag or

sack material being stitched in synchronism with the stitching and other operations of the machine.

A substantially vertical looper shaft 31 is mounted for sliding action and oscillation in an elongated bearing 31c affixed to a hollow boss 33 formed in the integral housing (see FIG. 3). Looper shaft 31 at its lower extension beyond the housing carries a substantially rectangular split head 31a at its lower end, said head including a chuck element 31b offset from the axis of shaft 31. The looper element 32 is removably affixed to chuck 31b.

Needle actuating mechanism

The needle lever arm 15 is swingably reciprocated through a short arc, power being derived from the main shaft 11 through simple and efficient driving connections. These connections (see FIGS. 3 and 1) comprise an eccentric 34 affixed to the upper portion of the main tubular shaft 12. Eccentric 34 has its periphery seated within a heavy rectangular pitman arm 35 (see FIGS. 1 and 3) which arm at its forward end has a ball seat 35a for accommodating the ball or spherical sector 18a of the upstanding actuating pin 18 previously referred to. Thus the pitman arm 35 in its cycle of movement causes the actuating pin 18 to move backward and forward, thereby swinging the needle lever in its operating strokes.

Looper actuating mechanism

Drive for the looper shaft 31 and the looper 32 is derived from the main tubular shaft 11 of the machine, primarily by a simplified cam assembly identified as an entirety by the numeral 36 which imparts up and down movements as well as slight oscillations to looper shaft 31 during the cycle of operation (FIGS. 3 and 1).

The assembly, in the form shown, comprises a relatively thick body 36a constituting a looper cam element of generally cylindrical configuration but mounted eccentrically upon and secured to the tubular shaft 11, and having an annular peripheral channel 36c which is rotatably surrounded by a two-piece strap or annulus comprising a pair of semi-annular parts 37 secured together as by cooperating attachment ears through the medium of clamping bolts or other means. The two-piece annular member comprising parts 37 is thus carried (see FIG. 3) in a position disposed obliquely of the axis of the tubular main shaft 11. In the form shown the cylindrical body member 36a is drilled to form a bore 36b, the axis of which extends at an acute angle to the longitudinal axis of shaft 11 and the eccentric and the body 36a is affixed thereto in the manner shown. One of the semi-annular pieces 37 carries an elongate slide rod or waggle pin 38 which extends generally radially of the cam member 36a and as shown, in a direction toward the right side wall 10d of the housing, for combined up and down swinging movement and also through a loop segment in the terminal portions of the up and down swinging movement.

The path of the tip of looper element 32 is approximately illustrated in FIGURE 7. A cross head bearing or knuckle, which is indicated as an entirety by the numeral 39 (see FIGURE 3), has a lower tubular bearing element 39a which surrounds the slide rod 38, journaling the same and also providing a slide bearing. Rigidly affixed to the lower bearing 39a and extending above it in crossed 90° relation is a second bearing element 39b of rigid tubular construction, in which is mounted a pin 40 which is connected at its forward end by a clamp 41 with the upper diminished cylindrical extremity of the reciprocating looper shaft 31. The cross-head bearing 39 with the lower tubular element 39a maintains the cam-surrounding split annulus 37 in proper relation throughout the revolutions of the body 36a and furthermore, because of the positioning of lower bearing 39a with reference to connection of the upper bearing 39b through its pin 40 impart slight oscillations to the looper shaft 31 resulting in a loop pattern, as generally

shown in FIG. 7. Thus, by our simple looper eccentric cam assembly and connection of its waggle pin or slide rod 38 by knuckle joint with the upper end of the looper shaft, in cycle the looper shaft is longitudinally reciprocated and at the terminal portions of each of the reciprocating strokes, is oscillated properly to swing the looper head 31a and looper 32 for operative relation with the cooperating needle 23. Our structure eliminates a considerable number of parts and linkage elements of the prior art and also lends itself particularly well for compact positioning of the parts relative to the main driving shaft 31.

Pump driving mechanism

A compact pump structure of conventional type indicated as an entirety by the letter P has its assembly extending through an aperture in the left hand side 10c of the housing and as shown is attached to the exterior of the upper left hand side of the housing by bolts or other means passing through the attachment flange 42 of the external pump structure.

Complete details of the pump need not be described since it is conventional, but in the outer polygonal shaped portion or housing 42a is provided essential communicating passages and valves. A short reciprocating piston 42b (see FIGS. 3 and 6) extends into the mounting housing having an outer end which is link connected by a link 43 with a central lug 44a of a short walking beam 44. The walking beam 44 as shown in FIG. 6, has its rearward end pivotally connected to a pitman arm 45 and its forward end pivotally connected with a suitable bearing lug 46 furnished by the inwardly projecting portion of the pump structure. The dotted lines in FIG. 6 show the moved positions of the described parts near the completion of the compression stroke of pump piston 42b.

A heavy pitman arm 45 is actuated by an eccentric disc 47 secured appropriately to main shaft 11 by a set screw or the like. It will be noted that the eccentric disc 47 (see FIG. 3) is disposed compactly just above the looper-cam assembly 36 and just below the eccentric 34 which controls swinging of the needle lever.

In operation the pitman 45 is gyrated by revolution of the eccentric disc 47 affixed to the common main shaft 11. The walking beam or link 44 is thus swingably reciprocated which in turn, through connection of the short linkage 43, reciprocates piston 42b of the pump.

The driving mechanism and linkage for actuating the feed dog 30 as well as the automatic stitch cutting mechanism per se, are old in the prior art.

Consequently, only important components of such mechanism will be described in detail. The moving parts hereinafter referred to, as will later appear, are all constantly lubricated by our important sealed in lubricating system.

Feed dog drive

Feed dog 30 is actuated through a narrow elliptical path. The lengthwise reciprocation for such actuation is derived through an eccentric 48 affixed to the medial portion of the main vertical shaft 11, just below the wobble plate structure 36 (see FIGS. 1 and 3). The connector pitman 49 surrounds eccentric 48 and is gyrated thereby, having an outer arm provided with a depending connector pin 49a which is clamped in a socket of a connector block 50. Said block 50 has linkage for rocking the sleeve 51 upon a fixed shaft 52, which shaft is affixed at one end to the left wall 10c of the general housing and at the other end to a depending web of the casting of the housing (see FIG. 3).

Slide sleeve 51 has an upstanding bearing 51a in which the feed dog mounting shaft 53 is journaled. This shaft 53 is reciprocated slightly in a direction at right angles to the axis of the slide sleeve 51 during its cycle of operation. Mechanism for imparting this small reciprocation is only partially shown but is mainly actuated by integral,

cylindrical shaft extension 11b which has its periphery slightly eccentric to the axis of the main shaft 11. A conventional stroke link 54 (FIGS. 3 and 4) is gyrated through the joint actions of said eccentric 11b and the pitman 49. Its outer end is adjustably pivoted by an adjustment pin 55 in conventional manner in an arcuately slotted lever 56 (FIGS. 3 and 4).

The toothed feed dog 30 has its teeth, which oppose the presser foot 29 working through a slot or slots formed in a rigid throat plate 30a, suitably supported on the exterior of the lower portion of the main housing. This same plate 30a carries the stationary knife 57 of the cutting mechanism. A flexible and elastic boot gasket 30b snugly surrounds the dog connector shaft 53 and in the gyratory movement of such connector shaft, seals it with the opening in the bottom portion of the housing through which it projects.

Reference to stitch cutter

Some of the linkage designated as M (see FIG. 3) for reciprocating the knife shaft K is shown. Here the knife shaft has been broken away to show mechanism rearwardly thereof. In FIG. 2 the knife shaft is fully shown with the knife secured to the lower end thereof.

Sealed lubricating system

From the description that follows it will be seen that our novel compact mounting of drive mechanism and particular derivations of power from the main rotary shaft, including our simplified looper driving mechanism, all closely cooperate to simplify automatic lubrication of all requisite bearings constantly when the sewing machine is in operation.

To facilitate understanding of our lubricating system by reference to the drawings, small alphabetical reference characters will be employed on passages and parts thereof.

The bore 11x of tubular main shaft 11 is utilized as a manifold for communication of oil to the bearing areas of many parts which are driven by shaft 11. The approximate level of liquid lubricant during operation of the machine is indicated at L in FIG. 3.

An elongated tubular conduit *a* extends upwardly from adjacent the bottom of sump S along the side wall 10c of the housing and connects with the intake *b* of the pump (see FIG. 3). The discharge *c* of the pump communicates through a short upwardly extending conduit *d* with a reservoir chamber *e* formed in the upper portion of housing 10 at one side thereof. A relief valve *d'* is interposed between the pump discharge and the upper conduit *d*, having an adjustable spring-pressed valve therein (not shown) which controls a small orifice. The outer side of reservoir chamber *e* is closed by a gasket-equipped closure plate *f*, preferably removable for cleaning the chamber. The chamber *e* (see FIG. 2) communicates by a short radial passage *e'* with the interior of the hollow cross shaft 14, the bore thereof being indicated by *i*. A plurality of radial ports *j* communicate the lubricant liquid from the bore *i* to the bearings for shaft 14 and also to the bearings for hubs 15a and 17a respectively of the needle lever 15 and presser arm 17.

It will be understood that in cooperation with the said ports *j* and the numerous other ports hereinafter to be identified, we prefer communicating with bearing surfaces to provide small annular oil channels (as shown in the drawings) either in the bearings or in the parts journaled, communicating with the ports so that all may flow around the entire bearing surfaces.

The radial port *k* extends through shaft 11 into bearing 12 for oiling the bearing surfaces at the upper portion of the main shaft.

A similar radial port *m* extends through shaft 11 and through eccentric 34 for supplying lubricant to the bearing surfaces of pitman 35 which actuates the needle lever.

A similar radial port *n* extends through shaft 11 and

the eccentric 47 which actuates the pump mechanism.

A port *o* extending through shaft 11 and radially through the thick eccentric-cam disc 36a supplies lubricant to the split annulus 37 surrounding the eccentric and also since the member is split and has a waggle movement in operation, supplies lubricant to the exterior of the wobble pin or slide rod 38 and thence to bearing 39a.

Another radial port *p* extends through the intermediate lower portion of shaft 11 and through eccentric 48 into communication with the bearing area of the pitman 49 which is a factor in driving dog 30 and also in actuating the cutter mechanism.

A similar radial port, unnumbered, positioned below port *p*, communicates with the lower bearing of shaft 11 for applying lubricant at that portion.

As seen from FIG. 3, the bore of the shaft extension 11b is diminished, but is in communication with the main bore of the shaft, and communicates through radial ports *q* with the exterior of the diminished eccentric 11b depending below the main portion of shaft 11.

As seen from FIG. 3, a spiral oil channel *r* is formed in the interior of the upstanding bearing 31c which receives and journals the looper shaft 31.

Again calling attention to the approximate liquid lubricant level *L* (see FIG. 3) it will be noted that the bearing areas of several of the working parts, including the bearing for the stroke link 54, the bearing 51a for the shaft 53 which carries the looper head and looper, and linkage behind these parts are normally immersed in the lubricant.

A slight leakage and dropping of oil from the bearing surfaces of the several eccentrics 34, 47, 36a and 48 spread oil and oil mist to the fast operating, movable linkage parts, including the waggle rod 38, the bearing 39a, the top of bearing 31c for the looper shaft 31, and all of the driving linkage which is disposed outwardly from the eccentrics mentioned. Thus, a splash system is set up relative to the exterior of all parts and bearings. Below the pump, actuating eccentric 47 and the gyratory travel of the cam eccentric 36a and rapid waggle of the pin shaft 38 and the knuckle joint 39, contribute materially to the effective splashing of oil within the intermediate portion of the sealed housing 10.

It is again pointed out that the very close spaced coupling of all of the parts within the sealed housing, with the actuating eccentrics disposed one above the other in close relation, with the passages and ports defined, contribute to a very efficient, automatic and constant lubrication system of all bearing surfaces of working parts within the housing and also assure efficient lubrication to the bearing surfaces for journaling of the needle lever and presser arm.

The interior of the entire main housing 10 with the exception of an air-breather orifice *O* formed through a screw-threaded plug 60 in the rear wall of the housing is sealed from communication with the surrounding atmosphere. Plug 60 as shown, contains a small cylindrical air filter *F* constructed of porous, spongy material. The said sealing of the main housing includes the use of the gasket 20 with the flexible section carrying bosses 20a and 20b for sealing with the upper portions of needle lever and presser arm, and also the sealing afforded by the boot gasket 30b (see FIGS. 2 and 4) which seals the periphery of the feed dog supporting shank 53 with the apertured portion of the housing through which shank 53 extends.

Below the lower right hand wall 10d of the housing, an access door 61 is provided, hinged by a pintle 61a for downward swinging forwardly of the rear portion of sump *S* and being retained in closed position by a spring actuated bolt 61b which not only gives access to the looper head 31a and the needle chuck, but it shields these parts from dust and other material.

For elevating the presser arm 17, suitable manually

controlled means is provided, which employs the shaft 26 previously described as a rock shaft, carrying a lever arm 26a which has slot connection with a pin 17b fixed to the medial portion of arm 17 (see FIG. 2). A handle 26b (see FIG. 4) is affixed to a portion of shaft 26, projecting beyond the left hand side of the housing. By manipulation of this handle, the presser arm may be adequately raised when desired.

We have not shown the thread spools or guiding of the threads to the needle and looper elements as this is conventional with our machine and it is to be understood that either a double thread chain stitch or a single thread chain stitch may be employed.

It will also be understood that while we are not restricted to the use of the structure with sealed in lubrication system and new looper mechanism for portable machines at the present time, the structure is particularly adapted for stationary machines which operate in conjunction with an elongated horizontal bag-carrier or slide. In such construction the level of the upper leaf of the endless conveyor or other medium used is disposed the appropriate distance below the needle so that the bag or sack, after filling, may proceed to the throat and presser foot and then to the feed dog mechanism through the machine without intermittent motion of the carrier.

From the foregoing description it will be seen that we have overcome, in our improved and simplified structure, many of the objections of the more cumbersome prior art including the provision of a greatly simplified, novel looper driving mechanism occupying little space and requiring few parts.

It will further be seen that with our improved compact structure and mounting of parts, a highly efficient automatic lubrication system has been provided to during operation of the machine, apply oil to all bearing surfaces.

It will of course be understood that various changes may be made in the form, details, arrangements and proportions of the various parts without departing from the scope of our invention.

What is claimed is:

1. In a sewing machine particularly adapted for closing bags and sacks, and employing reciprocating needle lever mechanism and presser arm mechanism,
 - an enclosed, sealed housing,
 - a powered rotary main shaft extending substantially through said housing,
 - an elongate looper shaft mounted within said housing for provision of sliding reciprocation as well as oscillation and having an extension passing through a portion of said housing,
 - means for sealing said extension with said housing,
 - drive mechanism within said housing for longitudinally and slidably reciprocating and simultaneously slightly oscillating said looper shaft, including a cam element affixed to said main shaft and linkage between said cam element and said looper shaft, the cam element having bearing surfaces and said linkage having bearing surfaces,
 - a material-feed dog mounted outside of said housing, a carrier shaft which extends within said housing, driving mechanism, all within said housing connected with said dog at its outer end for gyrating said dog-carrier shaft through a narrow elliptical path, said driving mechanism including an element affixed to a portion of said rotary shaft,
 - means for sealing said gyrating dog-carrier shaft with said housing,
 - a constant lubricating system having oil reservoir media within the confines of said sealed housing,
 - said main shaft having a lubricant-transmitting bore formed internally thereof, said system including said bore, said lubricating system including a pump mounted within the confines of said housing and link-

age for driving said pump from the power of said main shaft, said pump having an intake in communication with said oil reservoir media and having a discharge communicating with the lubricant bore of said main shaft,

an oil passage, communicating lubricant through the bore of said main shaft and the cam element of said looper drive mechanism to said bearing surfaces of said cam and to said bearing surfaces of said linkage between said cam element and said looper shaft, and an oil passage communicating lubricant from said bore of the main shaft and through said cam element in the driving mechanism for said feed dog.

2. The structure of claim 1 and bearings within said housing for journaling said main shaft,

an oil passage means communicating lubricant from within said main shaft to said shaft bearing.

3. The structure set forth in claim 1 further characterized by the needle lever of said machine having a fulcrum hub disposed in said housing,

means for sealing the periphery of said needle lever adjacent said fulcrum with said housing,

means for swingably reciprocating said needle lever confined within said housing and including an eccentric affixed to said main shaft, and linkage between said eccentric and said needle lever, also disposed within said housing,

an oil passage communicating lubricant through said main shaft and said needle arm eccentric to lubricate the bearing of said eccentric and to also lubricate the said linkage.

4. The structure set forth in claim 1 wherein said oil reservoir media is constituted by the lower portion of said housing and wherein linkage between the cam element for said looper shaft and elements of said dog driving mechanism are in rapid motion partially immersed in lubricant, producing a splash system of lubrication in the lower and medial portion of said housing.

5. The structure set forth in claim 4 wherein mechanism for driving automatic stitch cutting means is disposed wholly within said housing, and wherein the elements thereof are lubricated by the splash system.

6. The structure set forth in claim 1, further characterized by

said looper drive mechanism comprising a cam assembly having said cam member eccentrically mounted on said shaft with an exterior cam track disposed obliquely to the axis of said shaft,

an annular member surrounding said cam track and journaled therein,

said annular member carrying a fixed waggle pin extending radially thereof and towards one side of said housing adjacent part of said looper shaft,

connections between said waggle pin and said shaft including a slide sleeve in which said waggle pin is mounted for sliding and oscillation,

an oil passage means communicating the bore of said

main shaft and extending through said eccentric cam member for lubricating the cam track and for passing oil outwardly along said waggle pin and to said slide sleeve.

7. The structure set forth in claim 1 wherein the bearing surfaces of said driven elements have provision for slight leakage of lubricant to the exterior thereof and wherein linkage between the cam element of said looper shaft and elements of said dog driving mechanism are in rapid motion, all producing a splash and mist system of lubrication throughout the entire sealed housing.

8. In a sewing machine particularly adapted for closing bags and sacks, and employing a reciprocating needle lever mechanism,

presser foot mechanism and material-feed dog mechanism, and a main driven shaft,

those novel features which comprise a mounting,

a looper shaft supported in said mounting with provision for sliding reciprocation as well as oscillation and having a looper holder operatively associated with the needle arm and needle,

drive mechanism for longitudinally reciprocating and simultaneously slightly oscillating said looper shaft comprising,

an eccentric cam assembly having an eccentric element affixed to said main shaft and having a peripheral cam track disposed obliquely to the axis of said shaft,

an annular member surrounding said cam track and journaled therein,

said annular member carrying a generally radially disposed waggle pin extending towards one side of said housing and adjacent a portion of said looper shaft, and connections between said waggle pin and said shaft including a slide sleeve in which said pin is mounted for sliding and simultaneous oscillation.

9. The structure set forth in claim 8 wherein said slide sleeve carries a bearing element extending substantially transversely thereof and a pivotal connection for a portion of said looper shaft journaled in said bearing element.

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UNITED STATES PATENT OFFICE

Certificate

Patent No. 3,478,709

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George Irving Fischbein and Harold Fischbein

Application having been made by George Irving Fischbein and Harold Fischbein, the inventors named in the patent above identified, for the issuance of a certificate under the provisions of Title 35, Section 256, of the United States Code, adding the name of Sam Shark as a joint inventor, and a showing and proof of facts satisfying the requirements of the said section having been submitted, it is this 28th day of April 1970, certified that the name of the said Sam Shark is hereby added to the said patent as a joint inventor with the said George Irving Fischbein and Harold Fischbein.

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Law Examiner.