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Perkins et al.

[11] **3,858,780**

[45] **Jan. 7, 1975**

[54] **FASTENER-DRIVING TOOL**

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[73] Assignee: **Spotnails, Inc.**, Rolling Meadows, Ill.

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[21] Appl. No.: **321,972**

[52] **U.S. Cl.** **227/8**, 227/130, 227/136

[51] **Int. Cl.** **B25c 1/04**

[58] **Field of Search** 227/8, 130, 136; 92/170

[56] **References Cited**

UNITED STATES PATENTS

3,009,156	11/1961	Lerner	227/136
3,099,837	8/1963	Heilman et al.	227/130 X
3,353,737	11/1967	Howard et al.	227/136
3,496,840	2/1970	Wandel et al.	227/130 X
3,523,489	8/1970	Perkins	227/130
3,530,772	9/1970	Mori	92/170 X
3,543,987	12/1970	Obergfell	227/136
3,589,586	6/1971	Mazzer	227/130
3,597,572	3/1971	Readyhough	227/8
3,651,740	3/1972	Perkins	227/130
3,703,981	11/1972	Smith	227/136

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Attorney, Agent, or Firm—Neuman, Williams, Anderson & Olson

[57] **ABSTRACT**

A pneumatically powered tool is provided for use in driving fasteners into a work piece. The tool embodies an elongated reciprocating driver blade having a portion thereof embraced by a guide means. A nose section depends from the underside of a housing and has adjustably mounted thereon safety means whereby the driver blade cannot move through a driving stroke unless the safety means exerts a predetermined force against the work piece into which a fastener is to be driven. A cartridge of collated fasteners is removably mounted on the nose section. Fastener feed means is adjustably mounted on the nose section and is operatively connected to said cartridge for successively feeding fasteners into the paths of movement of the driver blade prior to the latter initiating its driving stroke.

1 Claim, 12 Drawing Figures

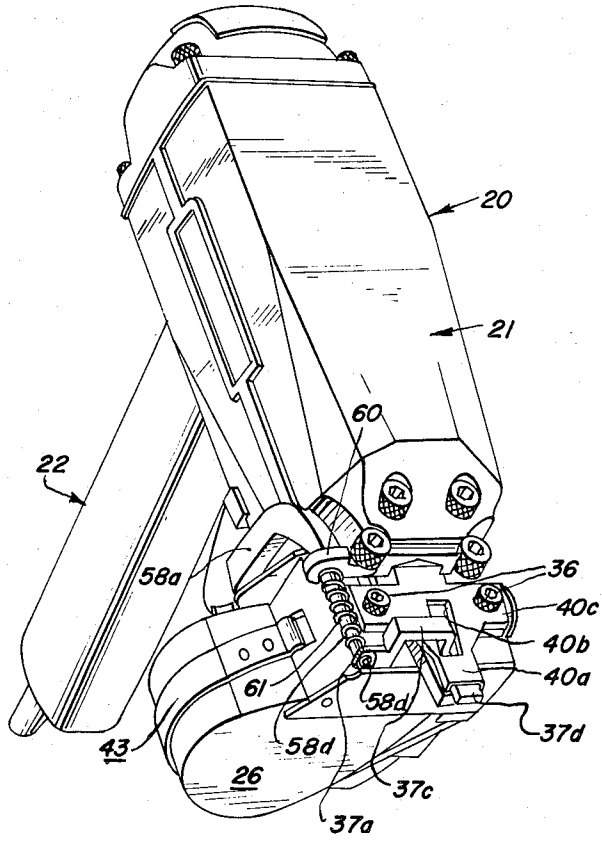


FIG. 1

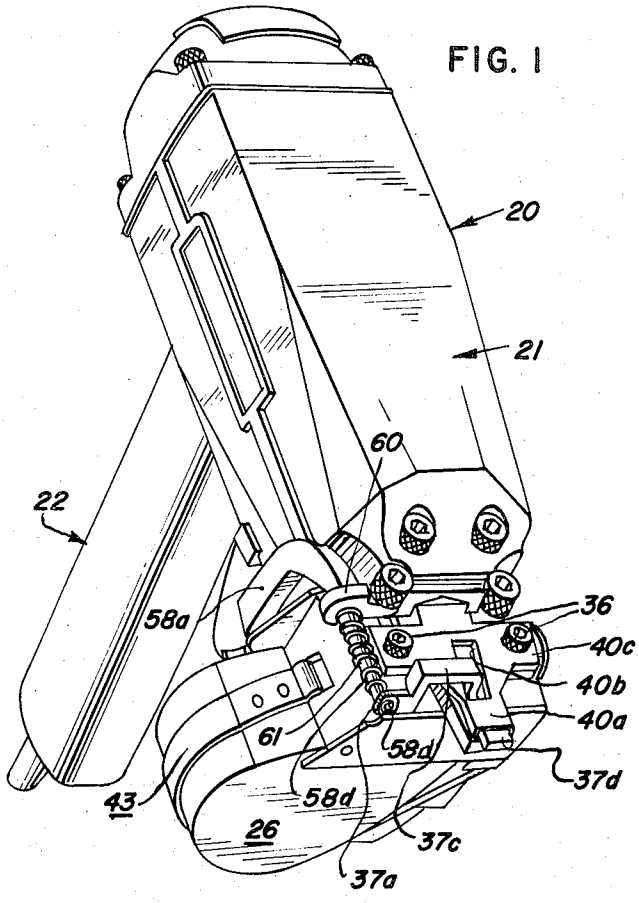
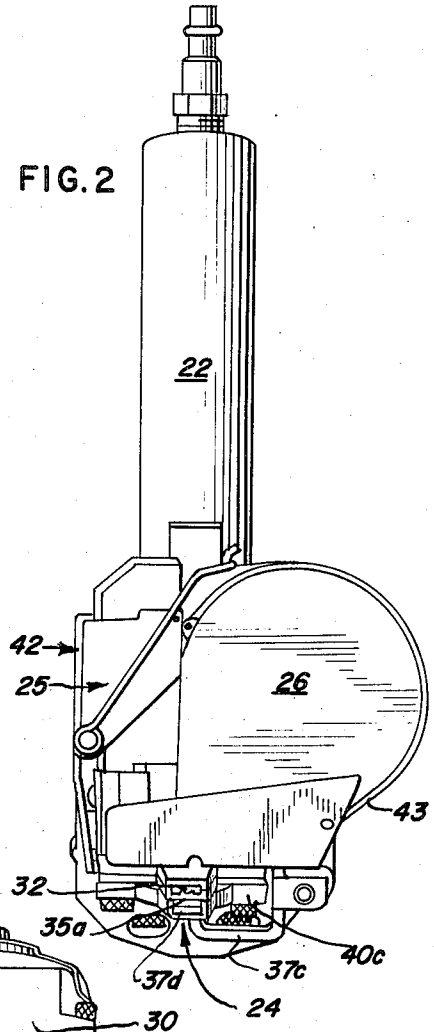


FIG. 2



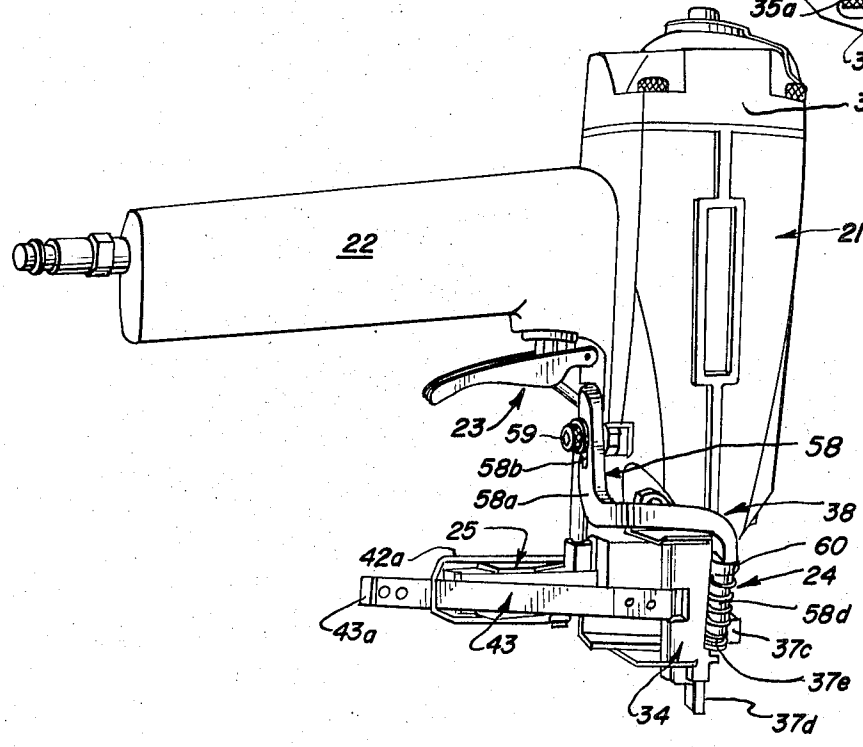


FIG. 3

FIG. 4

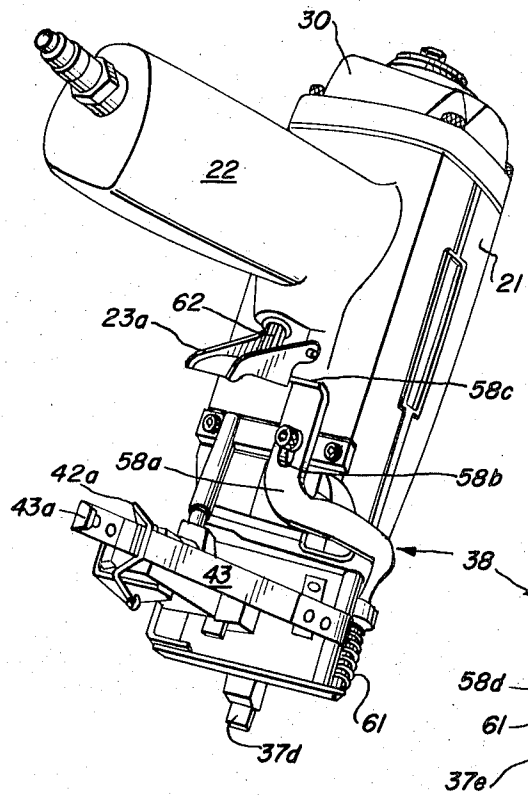


FIG. 5

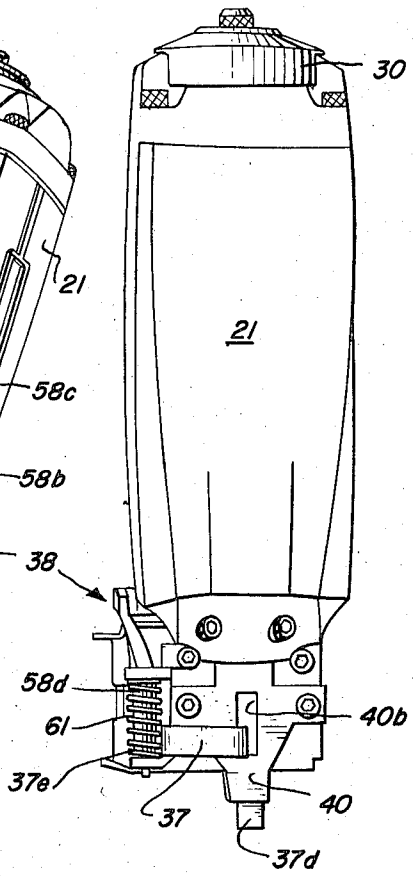


FIG. 6

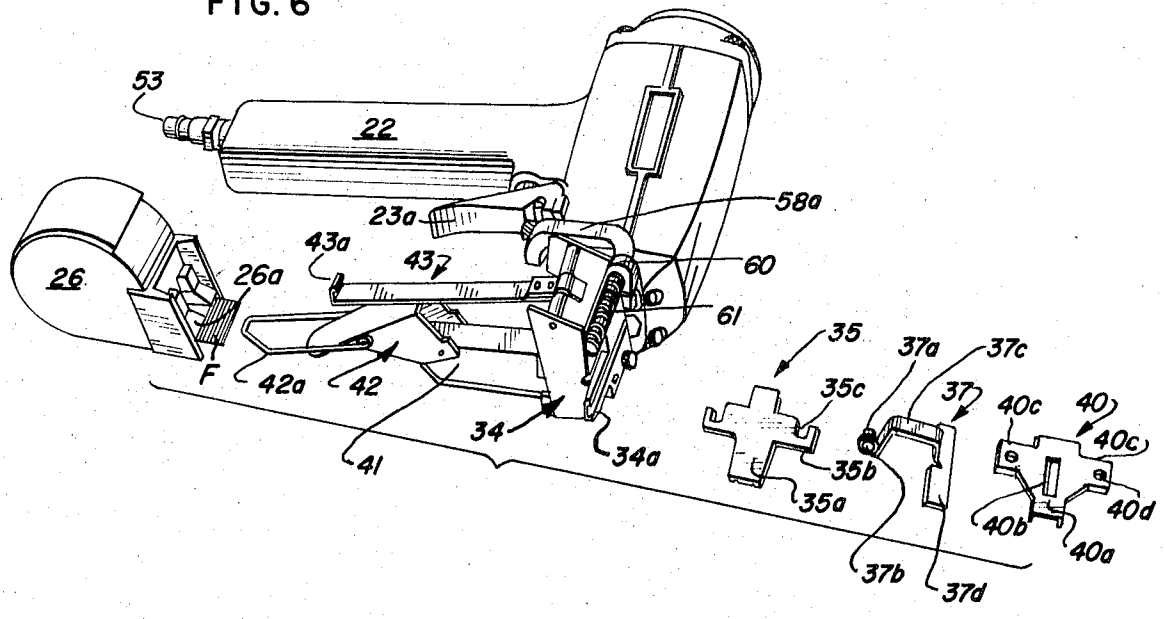


FIG. 9

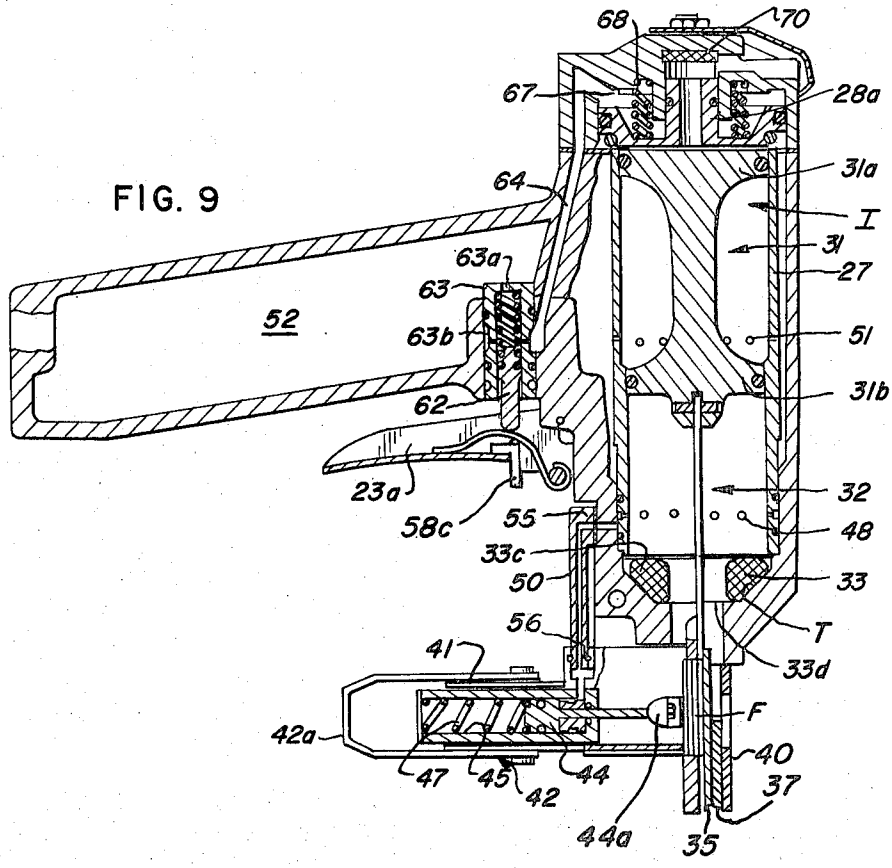
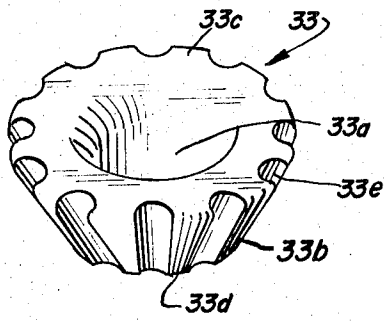


FIG. 12



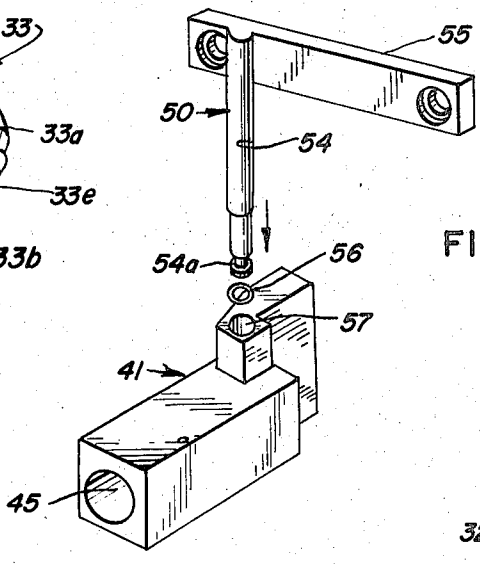


FIG. 7

FIG. 8

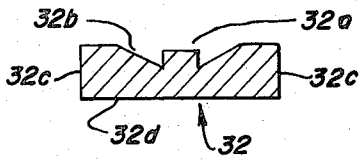
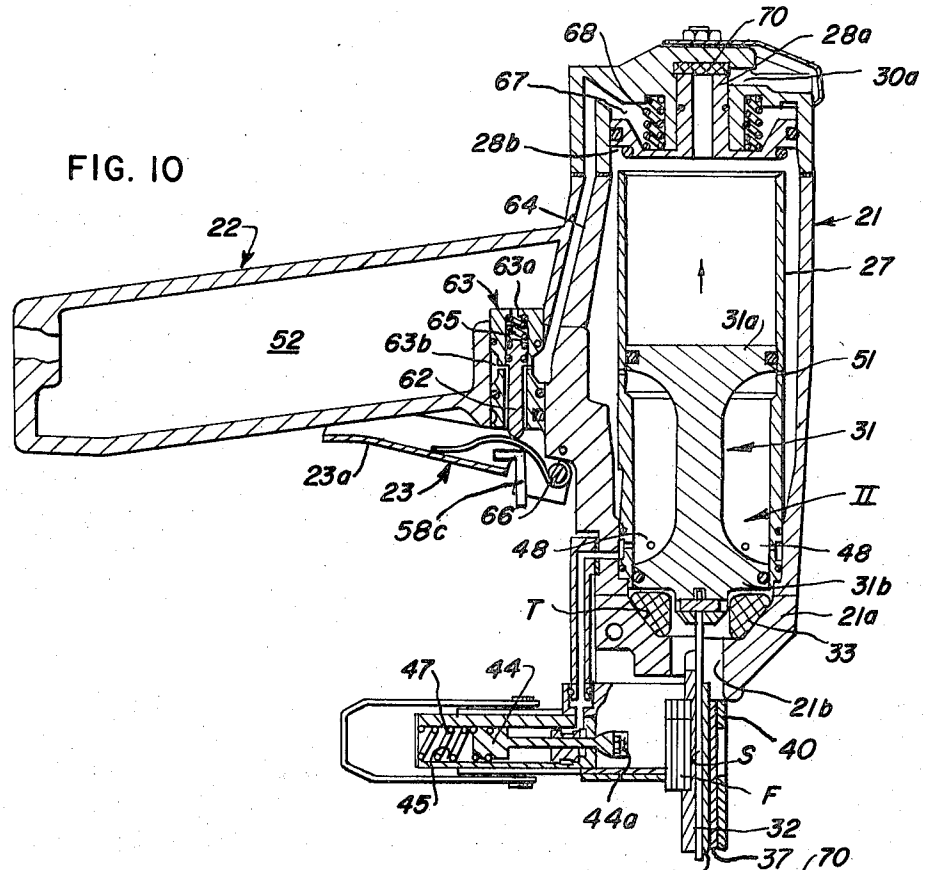


FIG. 10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23a
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58c
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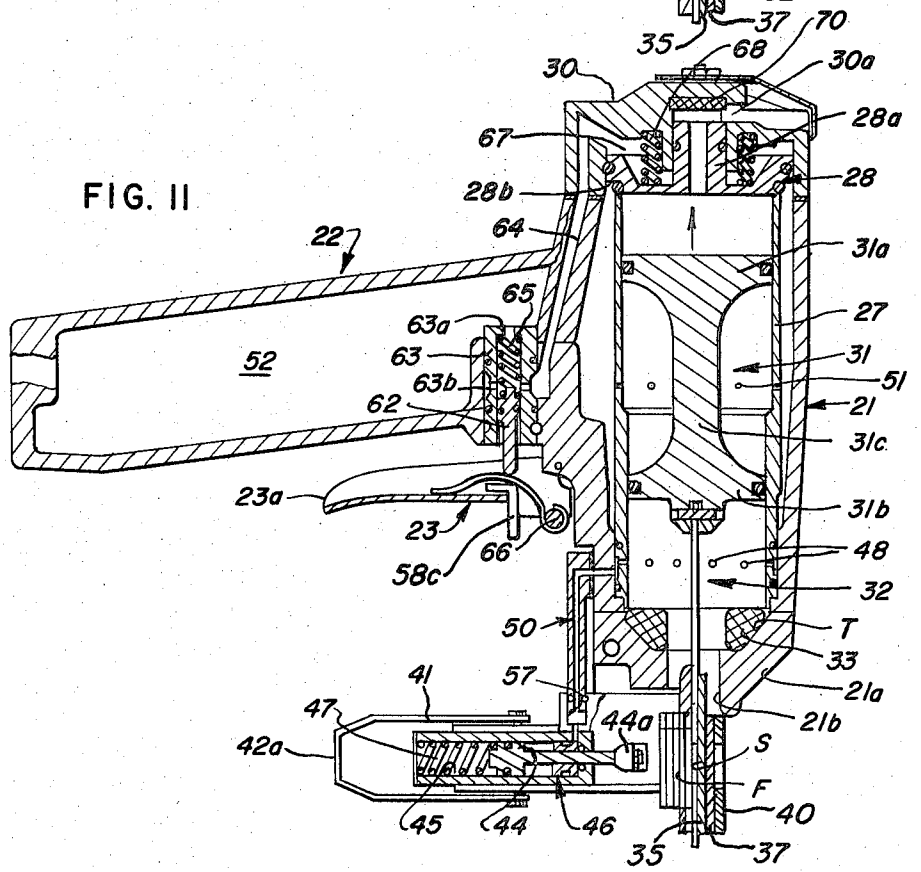
FIG. 11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FASTENER-DRIVING TOOL

BACKGROUND OF THE INVENTION

Various pneumatically powered fastener-driving tools have heretofore been provided; however, because of certain design characteristics, they have been beset with one or more of the following shortcomings: (a) the driver blade was susceptible to frequent breakage or damage; (b) the fastener capacity for the tool was limited and required frequent reloading; (c) the bumper piece for the drive piston was susceptible to rapid deterioration; (d) the safety mechanism incorporated in the tool was readily circumvented or was highly susceptible to jamming, thereby increasing materially the hazardous potential of the tool; (e) the efficiency of the operation of the tool was reduced by reason of a high coefficient of friction being generated between certain moving parts, particularly during prolong periods of operation of the tool; and (f) the tool was of a bulky design and was awkward to manipulate.

SUMMARY OF THE INVENTION

Thus, it is an object of the invention to provide a pneumatically powered fastener-driving tool which avoids the aforenoted shortcomings associated with prior art structures.

It is a further object of the invention to provide a pneumatically powered driving tool which is capable of accommodating a variety of fasteners varying in size and shape.

It is a still further object of the invention to provide a driving tool for collated fasteners wherein the fastener-feeding mechanism of the tool is not susceptible to frequent breakdown and enables the lead fastener to be readily severed from the remaining collated fasteners without adversely affecting the latter.

It is a still further object of the invention to provide a driving tool wherein the component parts thereof are of simple yet sturdy construction, and the kinetic energy of the driving piston is significantly increased while at the same time the exterior dimensions of the tool are reduced.

It is a still further object of the invention to provide a driving tool wherein replacement of various component parts thereof necessitates a minimal amount of down time.

Further and additional objects will appear from the description, accompanying drawings and appended claims.

In accordance with one embodiment of the invention, a pneumatically powered fastener-driving tool is provided which includes a reciprocating driving blade of thin cross-sectional configuration having an elongated reinforcing rib formed on at least one surface thereof. A guide means for the driving blade is provided which is disposed on the underside of the tool and is adapted to completely embrace a portion of the reciprocating driving blade and be in sliding engagement therewith. The driver blade is connected to and movable with a piston which, upon reaching the end of its driving stroke, engages a fixedly mounted bumper piece which dampens the kinetic energy possessed by the piston. The bumber piece has a doughnut-like shape with a portion of the driving blade extending through the center of the piece. The outer periphery of the bumper piece has an upwardly and outwardly tapered fluted configuration. The flutes of the bumper piece extend the full height of the tapered periphery and, thus, effectively dissipate the heat which might otherwise be absorbed by the piece due to the repeated impacts from the driver piston.

A safety mechanism is embodied in the tool which prevents initial actuation of the piston through its driving stroke unless one end of the safety mechanism is exerting a predetermined force upon the work piece into which the fastener is to be driven. The safety mechanism is provided with a spring for positively biasing the safety mechanism into a position wherein the drive piston will remain in a static condition.

DESCRIPTION

For a more complete understanding of the invention, reference should be made to the drawings wherein:

FIG. **1** is a perspective view of the discharge end of one form of the improved fastener-driving tool;

FIG. **2** is a bottom plan view of the tool shown in FIG. **1**;

FIG. **3** is a side perspective view of the tool of FIG. **1** but showing the cartridge of collated fasteners removed;

FIG. **4** is a back perspective view of the tool of FIG. **3** and showing the cartridge of collated fasteners removed;

FIG. **5** is a front elevational view of the tool of FIG. **1**;

FIG. **6** is a perspective, exploded view of the tool of FIG. **1**;

FIG. **7** is an enlarged fragmentary exploded perspective view of the fastener-feeding mechanism embodied in the tool of FIG. **1**;

FIG. **8** is an enlarged cross-sectional view of one form of the driver blade utilized in the illustrated tool;

FIGS. **9–11** are fragmentary vertical sectional views showing, respectively, the drive piston in a static position; at a position wherein the piston is disposed at the end of its drive stroke, and the piston returning to its static position; and

FIG. **12** is an enlarged perspective view of one form of the bumper piece utilized in the tool of FIG. **1**. Referring now to the drawings and more particularly to FIGS. **1–3**, one form of an improved pneumatic fastener-driving tool **20** is shown. The tool includes an elongated housing **21**, a laterally extending hollow handle **22**, a trigger mechanism **23** mounted on the underside of the handle, a nose section **24** depending from the lower end of the housing, a fastener-feed mechanism **25** mounted on and extending laterally from said nose section; and a cartridge **26** of collated fasteners F, the latter being formed into a tightly wound coil.

Housing **21**, as seen in FIGS. **9–11** is provided with an internal upwardly extending cylinder **27**. The upper end of the cylinder is closed by a poppet valve **28**. The poppet valve is contained within a cap **30** which is removably mounted on the upper end of the housing **21**. The housing and cap cooperate with one another to provide a low profile as compared to prior tools of this general type and, thus, facilitate manual manipulation of the tool. To compensate for the low profile, the cylinder **27** has a relatively large bore (e.g. 1.607 inch diam. upper section; 1.500 inch diam. lower section).

Mounted for reciprocatory movement within the cylinder **27** is a spool-type piston **31**, see FIGS. **9–11**. The upper and lower flanges **31***a* and **31***b*, respectively, of the piston carry peripheral O-ring seals which are in

sliding engagement with the interior surface of the cylinder. The upper flange **31***a* is of greater diameter than the lower flange **31***b* and, thus, enables the piston **31** to readily return to its static position I, (FIG. **9**), once it has reached the terminus II, (FIG. **10**) of its drive stroke. The movement of the drive piston **31** will be described more fully hereinafter.

The upper and lower flanges of the piston are interconnected by a stem portion **31***c*. The piston **31** is relatively heavy and, thus, is capable of substantial kinetic energy.

Carried on the underside of the piston and depending therefrom is an elongated driver blade **32** which, during movement of the piston through the drive stroke, will engage the trailing end of the fastener when the latter is disposed within a firing station S formed in the nose section **24.** The downwardly moving driver blade will cause the engaged fastener to be separated from the remaining collated fasteners and be discharged from the tool into the desired work piece, not shown. The driver blade **32** has a relatively flat cross-sectional configuration as seen in FIG. **8.** The outwardly disposed surface of the blade **32** is provided with an elongated narrow rib **32***a*. The portions **32***b* of the blade surface disposed on opposite sides of the rib **32***a* converged downwardly a slight amount. By reason of the convergence of the surface portions, the lateral end limits of the blade cross-section will remain as thick or thicker than the center portion of the blade which includes the rib. Thus, by having the lateral end limits of the blade undiminished in thickness, the blade will be possessed of greater strength and can be more readily supported during the drive stroke of the piston **31.**

Disposed within the cylinder interior and adjacent the lower end thereof is a bumper piece **33,** see FIGS. **9–12,** which is adapted to absorb the kinetic energy of the piston **31** when it reaches the terminus of its drive stroke, see FIG. **10.** The bumper piece is preferably of molded one-piece construction and is formed of a suitable resilient material capable of withstanding repeated impacts and high temperatures. The bumper piece has a modified doughnut-like configuration with a center hole **33***a* through which the driver blade extends. The exterior annular side wall **33***b* of the piece is fluted and tapered so that the top surface **33***c* is of greater dimension that the bottom surface **33***d*. It will be noted in FIG. **12** that the flutes **33***e* are symmetrically arranged and extend the full height of the piece. The flutes permit air flow to occur about the piece as the piston reciprocates and, thus, provide an effective means for dissipating the heat which might otherwise build up within the piece, especially when the tool is operated for prolong periods of time.

As seen in FIGS. **9–11,** the bumper piece **33** is disposed within a tapered seat T which is formed within a removable bottom section **21***a* comprising the housing and, thus, facilitates replacement of the bumper piece when necessary. Bottom section **21***a* is provided with an enlarged central opening **21***b* which is coaxially aligned with the hole **33***a* in the bumper piece. The opening **21***b* provides a continuous vent to the atmosphere for the lower interior portion of the cylinder **27.**

The nose section **24** includes a depending member **34** which is fixedly secured to the lower end of the housing **21.** One side of member **34** is provided with an elongated channel-shaped passageway **34***a* through which moves the protruding portion of the driver blade **32.** Because of the undiminished thickness of the lateral end limits of the blade, a substantially greater surface area of the blade is slidably supported by the member **34.**

Removably mounted on the depending member **34** so as to overlie the open side of the channel-shaped passageway **34***a* is a front plate **35,** see FIG. **6.** The plate **35** is provided with an elongated central portion **35***a* having the surface thereof facing the passageway **34***a*, contoured so as to substantially conform to the ribbed surface of the driver blade **32.** Thus, passageway **34***a* and the central portion **35***a* of front plate **35** coact with one another to form a guide which completely encompasses the portion of blade **32** which projects out through the opening **21***b* during reciprocatory movement of the drive piston **31.** Because of the front plate central portion **35***a* and the passageway **34***a* encompassing the projecting blade portion, effective support for the reciprocating blade is maintained, thereby materially reducing the incidents of blade failure. Heretofore, because of the lack of proper support for the reciprocating blade, particularly during the drive stroke, the thin blade oftentimes would break or become bent, thereby requiring replacement.

As seen in FIG. **6,** the front plate **35** is also provided with a pair of lateral extensions **35***b*. The distal ends of the extensions **35***b* are provided with open-end slots **35***c* through which assembly bolts **36** are adapted to pass. The slots permit a slight adjustment of the plate with respect to the member **34** so that the guide will be properly aligned with the protruding blade portion.

Positioned outwardly of the front plate **35** is the lower section **37** of a safety yoke **38** which will be described hereinafter. Removably mounted on and outwardly disposed with respect to the yoke section **37** is a retainer and guide unit **40** for said section. The unit **40** is provided with an elongated channel-shaped central portion **40***a*. The central portion **40***a* is provided with an elongated slot **40***b*. Unit **40** also includes laterally extending shoulders **40***c* which are adapted to be aligned with and overlie the corresponding extensions **35***b* of the front plate **35.** Suitable openings **40***d* are formed in the shoulders **40***c* so as to accommodate the shanks of the assembly bolts **36.**

Nose section **24** also includes a rearwardly extending hollow projection **41.** The projection is offset with respect to the path of movement of the driver blade **32** and has pivotally mounted on the outer end thereof a clasp **42.** The clasp cooperates with a flexible band **43** which is attached at one end to the depending member **34,** see FIG. **6.** The free end **43***a* of the band is hook-shaped and is adapted to interlock with an adjustable loop **42***a* carried by the clasp **42.** The band **43,** when interlocked with the clasp **42,** snugly embraces the exterior of cartridge **26** when the latter is assembled on the nose section **24,** see FIG. **1.** The clasp **42** is manually adjustable to lock or unlock positions.

The cartridge **26** may be of a type similar to that described in U.S Pat. No. 3,009,618 and is provided with a tangentially extending rail section **26***a* through which the web of collated fasteners passes when unwound from the coil contained within the cartridge. The rail section **26***a* communicates with the infeed side of the firing station S formed in the depending member **34.** The axis of the coil contained within the cartridge **26** is disposed substantially parallel to the path of movement of the driver blade **32.**

The hollow projection 41 includes a piston 44 mounted within a cylinder 45; said piston and cylinder comprising components of the fastener-feeding mechanism 25. The function of the mechanism 25 is to advance the web of collated fasteners F a predetermined amount as the driver moves towards the static position I, thereby enabling the leading fastener to be loaded into the firing station S. The forward end of piston 44 is provided with a suitable pusher head 44*a* which at the appropriate time period will engage and move the feed fingers of the cartridge 26, the latter being of a type similar to that described in U.S Pat. No. 3,009,618, and then move the web of collated fasteners. The rear end of the piston 44 is disposed within the cylinder 45 and is engaged by a coil spring 47 so that the piston 44 is spring-biased to assume an extended position as shown in FIG. 9. The piston 44 overcomes the bias of spring 47 only when the pneumatic force is applied to the forward end of the piston 44. This condition occurs when the driver piston 31 has reached a position during the drive stroke wherein a first set of openings 48 formed in the wall of the drive cylinder 27 is uncovered and communicates with the set of openings 51 through the space formed between the flanges of the piston, see FIG. 10. The openings 48 are in communication with a conduit 50 which interconnects the interior of the housing 21 with the interior of cylinder 45.

A second set of openings 51 is also formed in the drive cylinder wall, and each opening thereof is continuously in communication with a cavity 52 formed in the hollow handle 22. The cavity 52 is always charged with pneumatic pressure when the outer end of the handle is connected to an air hose, not shown, leading to a source of pneumatic pressure. It should be noted that the second set of openings 51 is located so that regardless of the relative position of the piston within the cylinder 27, each of said openings is always in communication with the space separating the flanges 31*a* and 31*b* of drive piston 31. Because of the dimensional differential between flanges 31*a* and 31*b*, there is always a bias exerted by pneumatic pressure on the drive piston 31 urging the latter to assume static position I.

The conduit 50, which interconnects the interior of housing 21 with cylinder 45 is shown more clearly in exploded relation in FIG. 7. The conduit 50 in the illustrated embodiment, consists of a tube 54 having a side opening at the upper end and provided with a mounting bracket 55. The side opening is aligned with an opening in the bracket which, in turn, is in communication with the first set of openings 48 formed in the cylinder wall 27. The lower end of the tube 54 is open and has an exterior of reduced diameter. In addition, the lower end is provided with a peripheral groove 54*a* which accommodates an O-ring seal 56. As seen in FIGS. 9–11, the lower end of tube 54 is disposed in a substantially free floating relation within an upwardly facing opening 57 formed adjacent the inner end of projection 41. The O-ring seal 56 sealingly engages the wall of opening 57. Notwithstanding the severe vibrations to which the tool is subjected during normal operation, the seal connection between the lower end of tube 54 and the opening 57 will be maintained.

The lower end of opening 57 communicates with the inner end of cylinder 45, see FIGS. 9–11.

When the driver piston 31 is in a position at or adjacent to the terminus of its drive stroke, the inner end of the fastener-feed cylinder 45 will be exposed to the pneumatic pressure in cavity 52 and thus, the feed piston 44 will move outwardly overcoming the bias of spring 47. At all other times the inner end of the feed cylinder 45 is vented to the atmosphere by means of conduit 50, first set of openings 48 and the openings 33*a* and 21*b* formed, respectively, in the bumper piece 33 and the housing lower section 21*a*, see FIG. 11.

To insure trouble-free operation, it is preferred to coat the walls of cylinders 27 and 45 with a material having a very low coefficient of friction (e.g., polyfluro and polyflurohalo-olefins, such as polytetrafluoroethylene, polychlorotrifluoroethylene, etc., sold under such tradenames as Teflon, Tufware, and Kel-F). Because of the aforesaid coating, the tool may be effectively operated at lower pneumatic pressures with the result that the operational life of the tool will be substantially extended.

The safety mechanism 38 embodied in the illustrated tool includes not only the lower safety yoke 37, and retainer and guide unit 40 but also an upper safety yoke 58, which is independent of the lower yoke. The upper yoke 58, as seen in FIGS. 3–5, is of one piece construction and has an elongated distorted central portion 58*a* which is provided with an elongated longitudinally extending slot 58*b* through which a guide pin 59 extends. The upper end 58*c* of the yoke is laterally offset so as to engage a lever 23*a* forming a part of the trigger mechanism 23. The lower end 58*d* of yoke 58 extends through an opening formed in a bracket 60, the latter being affixed to the front side of the nose section 24, see FIG. 1. The portion of the lower end 58*d*, which depends from bracket 60, is embraced by a coil spring 61. The upper end of the spring engages the bracket 60 and the lower end of the spring engages a collar 37*a* formed on lower yoke 37. Collar 37*a* is provided with an opening 37*b* through which the terminus of lower end 58*d* slidably extends. The lower end 58*d* is of reduced diameter. Spring 61 exerts a downward bias on the lower yoke 37.

Yoke 37 is provided with a curved center portion 37*c* which interconnects collar 37*a* with a tongue 37*d*. The center portion 37*c* extends through the slot 40*b* formed in the retainer and guide unit 40. The lower end of tongue 37*d* normally extends downwardly from unit 40, see FIG. 5, and when the tool is to be operated is brought into contact with the surface of the work piece, not shown, into which the fastener is to be driven. The tongue 37*d* must be retracted into retainer and guide unit 40 before the trigger mechanism 23 will be operative.

As seen in FIGS. 9–11, the trigger mechanism 23 includes a valve piece 62 which is slidably disposed within a sleeve member 63. The sleeve member is mounted on the underside of handle 22 and the upper end of the sleeve member has a restricted opening 63*a* which communicates with the chamber 52 formed in the handle. At approximately mid-length of member 63 is a peripheral passageway 63*b* which, in turn, communicates with an internal passageway 64 formed in housing 21. The valve piece 62 is biased in a down position by a coil spring 65, which is disposed within sleeve member 63 between the upper end of the valve piece and the upper end of the sleeve member. The lower end of the valve piece 62 is fluted and normally projects downwardly from the lower end of the sleeve member 63 and engages the lever 23*a* of the trigger mechanism

23. The combined tensions of spring 65 and spring 61 must be overcome when the tongue 37*d* is retracted into the nose section in order that the trigger mechanism will be operative. The upper offset end 58*c* of the upper yoke 58, when in its down position, as seen in FIGS. 3 and 4, will engage an offset lip formed on lever 23*a* and prevent the lever from being manually pivoted in a clockwise direction about pin 66. When the tongue 37*d* is retracted, the collar 37*a* of the lower yoke 37 will engage a shoulder 37*e* (see FIGS. 3 and 5) causing the upper yoke 58 to move upwardly and, thus, release the lever 23*a*.

When the valve piece 62 is in its inoperative or down position, as seen in FIG. 9, the passageway 64 is charged with the pneumatic pressure accumulated in chamber 52 of the handle. The upper end of passageway 64 communicates with a cavity 67 formed in the interior of cap 30. The poppet valve 28 is slidably mounted within cavity 67 and when passageway 64 is charged with pneumatic pressure, the poppet valve will be held in a down or closed position with respect to the upper end of cylinder 27. The poppet valve 28 is normally biased in the closed position by a spring 68. An upwardly extending tubular portion 28*a* is formed on valve 28 which permits the portion of the cylinder 27, disposed above the flange 31*a* of the drive piston 31, to be vented to the atmosphere through an opening 30*a* when the poppet valve is in its down position with respect to the upper end of the cylinder.

When valve piece 62 is manually moved upwardly relative to sleeve member 63, communication between the chamber 52 and passageway 64 is blocked, and because of the fluted lower end portion of the piece 62, passageway 64 is vented to the atmosphere. Once cavity 67 of cap 30 has been vented to the atmosphere by passageway 64, the poppet valve 28 will be moved upwardly off the upper end of cylinder 27, as seen in FIG. 10. Upward movement of the poppet valve 28 is effected by the pneumatic pressure within chamber 52 being exerted on the underside of the outer periphery 28*b* of the poppet valve which projects laterally beyond the upper end of the cylinder 27. The pneumatic pressure exerted on the underside of peripheral portion 28*b* overcomes the bias of spring 68. When the poppet valve is in its open or up position, see FIG. 10, the central tubular portion 28*a* will sealingly engage a seal piece 70 carried by cap 30, thereby closing off the venting of the upper portion of the cylinder to the atmosphere through opening 30*a*. While the poppet valve 28 is in its up position, pneumatic pressure will be exerted on the upper surface of piston flange 31*a*, causing the piston to move rapidly downwardly through its drive stroke.

Once the drive piston 31 has reached the end of its drive stroke and the trigger lever 23*a* has been released, the poppet valve 28 will resume its closed position, whereupon the upper portion of the cylinder 27 will be vented and the drive piston 31 will return to its static position I. As aforementioned, the return of the piston to its up position is due to the pneumatic pressure which has accumulated in the space between the piston flanges 31*a* and 31*b* through the openings 51 formed in the wall of cylinder 27. Flange 31*a*, as aforenoted, has greater surface area than flange 31*b* and, thus, accounts for the upward movement of the piston.

When the piston 31 is in static position I (FIG. 9), the handle chamber 52, passageway 64, cavity 67 and the space between the piston flanges are all charged with pneumatic pressure and at the same time, the lower portion of the cylinder 27 and the feed cylinder 45 are vented to the atmosphere. Upon the trigger lever 23*a* being depressed (FIG. 10), passageway 64, cavity 67 and the lower portion of cylinder 27 (that is the portion beneath the lower flange 31*b*) are all vented to the atmosphere while the portion of cylinder 27 above flange 31*a* and the space between the piston flanges are charged with pneumatic pressure and cause the drive piston 31 to rapidly move downwardly through the drive stroke. Upon the driver piston 31 reaching the terminus of its drive stroke (position II, FIG. 10), the openings 48 formed in the cylinder wall 27 are in communication with the space between the piston flanges 31*a* and 31*b* which has previously been charged with pneumatic pressure through the openings 51. Upon openings 48 being exposed to the pneumatic pressure, the passageway within conduit 50 and the right hand side of fastener-feed cylinder 45 are charged with the pneumatic pressure thereby causing feed piston 44 within cylinder 45 to move to the left, as seen in FIG. 10.

When trigger lever 23*a* is released, the conditions recited in connection with the piston in position I are repeated whereupon the piston will move from position II to position I, see FIG. 11.

Thus, it will be seen that a pneumatically powered fastener-driving tool has been provided which has a low profile, can operate effectively on lower pneumatic pressure, is less susceptible to breakdown, and is provided with an effective fool-proof safety mechanism.

We claim:

1. A pneumatically powered low profile fastener-driving tool comprising a housing provided with a cylinder adapted to have the upper end thereof normally closed by an adjustably mounted poppet valve; manually operable trigger means mounted on said housing for controlling the movement of the poppet valve to an open position relative to the upper end of said cylinder; a drive piston mounted for reciprocatory movement within said cylinder and carrying an elongated depending driver blade, the latter having a portion thereof protruding from the underside of said housing, said piston normally assuming a static position adjacent the upper end of said cylinder when said trigger means is at rest and said poppet valve is in a closed position, said piston moving through a drive stroke only when said trigger means is manually manipulated causing the poppet valve to assume an open position; a nose section mounted on and protruding from the underside of said housing, said nose section including a sectional guide means encompassing the driver blade protruding portion; safety means adjustably mounted on said nose section for movement between extended and retracted positions, said safety means, when in a retracted position, causing said trigger means to be responsive to manual manipulation and, when in an extended position, causing said trigger means to be non-responsive to manual manipulation; a removably mounted magazine of collated fasteners; and a fastener-feed assembly mounted on said nose section and on which said magazine is removably mounted, said assembly including a cylindrical member, a pneumatically responsive feed piston mounted for reciprocatory movement within said cylindrical member to effect intermittent feeding of a collated fastener from said magazine into alignment with

said driver blade only when the latter has moved a predetermined amount in one direction, said feed piston being biased to move in a direction towards said guide means, and conduit means having a first portion in communication with the cylinder within said housing and a second portion in a free-floating pneumatically sealed relation with the cylindrical member of said feed assembly; said driver blade being provided with a substantially planar elongated first surface in slidable engagement with a section of said sectional guide means, elongated narrow second surfaces of substantially like configuration disposed along opposite peripheral sides of said first surface and extending angularly in substantially one direction from said first surface, and an enlongated reinforcing rib formed on a third surface opposite said first surface, said third surface having portions thereof disposed on opposite sides of said rib converging from said second surfaces towards the base of said rib, the thickness of said blade in vicinity of said reinforcing rib and said second surfaces being substantially the same, said second and third surfaces of said blade being in slidable engagement with a section of said sectional guide means.

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UNITED STATES PATENT OFFICE

CERTIFICATE OF CORRECTION

Patent No. 3,858,780 Dated January 7, 1975.

Inventor(s) Garry R. Perkins and Joseph Schwert

It is certified that error appears in the above-identified patent and that said Letters Patent are hereby corrected as shown below:

In the references cited, "3,597,572"

should be - 3,572,572

In the Abstract, "the" should be - said -

Col. 5, line 6, after "driver" insert - piston -

Signed and sealed this 13th day of May 1975.

(SEAL)
Attest:

RUTH C. MASON
Attesting Officer

C. MARSHALL DANN
Commissioner of Patents
and Trademarks