

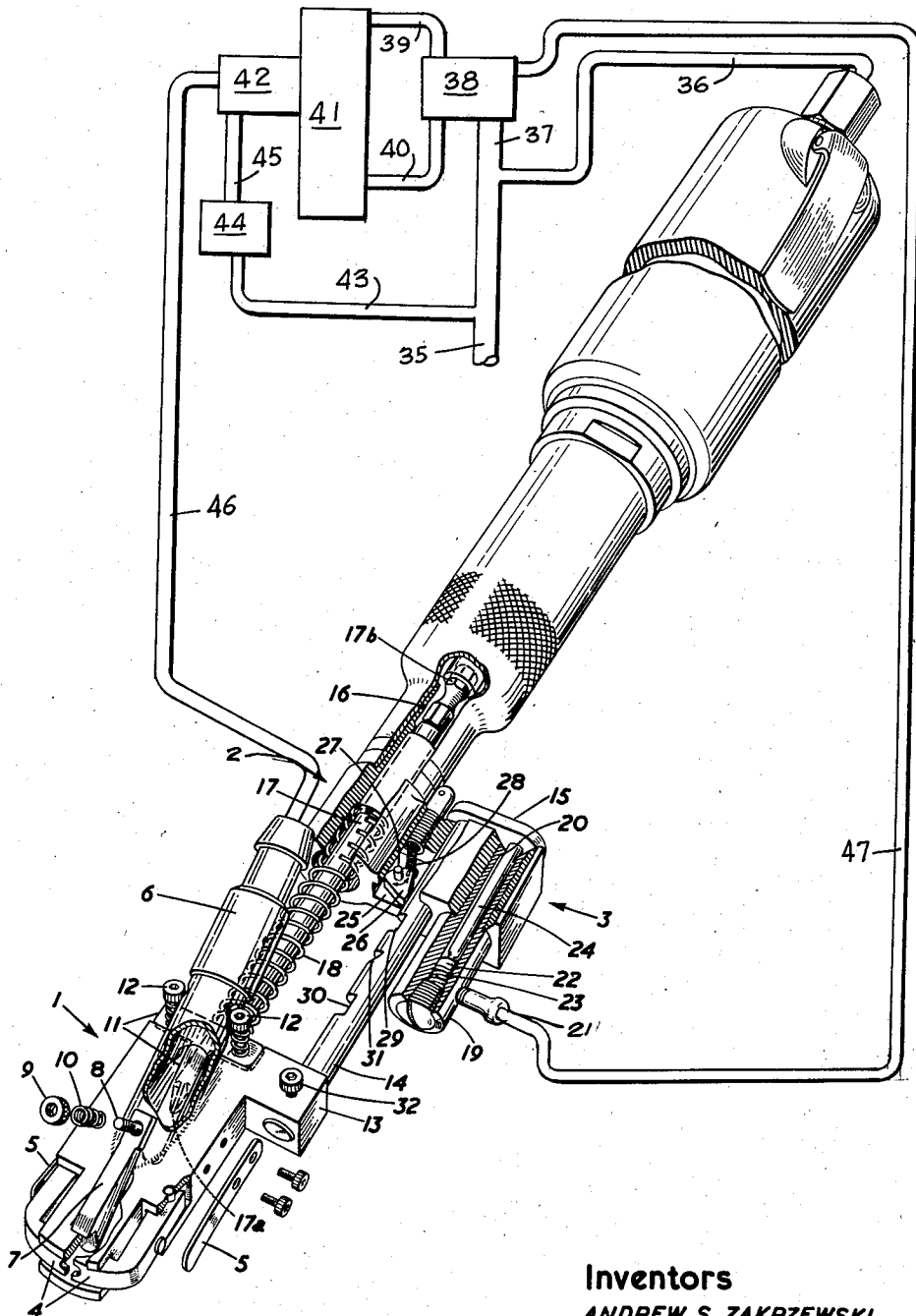
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HEAD FOR POWER OPERATED SCREW DRIVER

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HEAD FOR POWER OPERATED SCREW DRIVER

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This invention relates to a fastener feeding and fastener holding head for a power operated driving tool of the kind which may be used with a fastener serving machine of the type exemplified in Patent No. 2,754,860, dated July 17, 1956, and assigned to Taymouth Industries Limited.

In the aforesaid patent there is disclosed a fastener serving machine which supplies fasteners to a power operated driving tool at the will of the operator; on each depression of a control valve located on the driving tool, an air circuit to the serving machine is completed whereby a cycle of operation of the serving machine is initiated to chase a fastener into the head of the driving tool to which the machine is connected. There is disclosed herein an improved head for such driving tools.

It is a main object of the invention to provide a head for a fastener driving tool having improved means whereby the cycling of the fastener serving machine to which the head is connected is controlled automatically and independently of any conscious act of the operator.

It is another object of the invention to provide a head which embodies a control for a serving machine, the control being so constructed that double activation of the serving machine is prevented, thus insuring that only one fastener can be fed to the head at one time and that a second cannot be fed until after the first has been driven into position (or otherwise ejected) and the head is ready to receive the next fastener.

It is a further object of the invention to provide a head having means whereby a fastener which is gripped in the head collet is prevented from being pushed back within the head when the head is applied against the work.

The invention is more particularly described in the accompanying drawing, which is a broken away perspective view, partly exploded, of a head constructed in accordance with the invention and shown coupled to a suitable driving tool.

The head comprises three main components, namely a body generally indicated at 1, an adaptor generally indicated at 2 and a control means provided by a valve assembly generally indicated at 3. The body 1 includes a chambered housing adjacent the top of which are two opposed recesses in which are pivotally mounted jaws 4 which are urged to closed position by suitable biasing means such as leaf springs 5; the jaws and the leaf springs together constitute a collet or fastener guiding member. Integrally secured to the housing is an entry tube 6 which is disposed at an acute angle relative to the housing. One end of the entry tube is for connection to a supply of fasteners, such as the serving machine disclosed in the aforesaid Patent No. 2,754,860, while its exit end opens into the chamber of the housing.

Extending through an aperture in the housing is a stop arm 7, the free end of which is positioned as shown adjacent the collet constituted by the parts 4 and 5, and the other end of which is mounted for limited swinging movement on a pin 8. The mounting hole in the stop arm 7 through which extends the pin 8 is somewhat

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larger than the diameter of the pin so that the free end of the stop arm may be pivoted in a radial plane relative to the pin. The stop arm is held on the pin by cooperating means including a nut 9 and a light spring 10 interposed between the stop arm and the under side of the nut. It will be apparent that when a fastener is held by the collet and if a rearward force is applied to the fastener, the stop arm bearing on the head of the fastener will prevent the fastener from being forced rearwardly into the housing.

Mounted on the housing and extending through a slit located at the crotch created by the junction between the housing and the entry tube 6 is a T-shaped blade or leaf spring 11. The cross-arm of the blade 11 is held on the housing by means of cap screw and spring assemblies 12, whilst its leg or free end extends within the housing and normally is biased to guiding position where it provides what is in effect a continuation of the entry tube 6 and thus guides fasteners passing from the entry tube and into the chamber, the blade being swingable to a blocking position where it blocks the exit of the entry tube. When a fastener is chased by compressed air from a serving machine to which the entry tube 6 is connected, it will be deposited within the chamber and after deflecting the stop arm 7 it will be gripped by the collet.

Secured to a transverse extension 13 of the housing is a longitudinally disposed rod 14 on which the adaptor 2 is slidably mounted for reciprocation. At the free end of the rod 14 is a stop bar 15 which limits the longitudinal movement of the adaptor relative to the body. The adaptor includes a cylindrical housing 16, the upper end of which is adapted to be coupled to the operative end of a conventional power operated driving tool, as shown. A fastener driving shank 17 is mounted for rotation within the adaptor 16, its driven end 17b being adapted to be connected to the driving motor of the driving tool and its driving end 17a extending within a passage that forms part of the chamber in the body 1. A compression spring 18 encompasses the shank 17 and is interposed between the adaptor 2 and the body 1 to urge the adaptor and the body away from each other.

In order to drive a fastener which previously has been positioned in the collet, the operator holds the driving tool to position the fastener against the work and then thrusts the tool forwardly thus causing the body and the adaptor 2 to move relative to each other to a position (which for convenience is referred to as a "first position") where the shank is advanced. The shank then is caused to rotate by the motor of the driving tool, and as its tip 17a engages with the head of the fastener, the fastener is driven and eventually is forced out of the collet.

The exit end of the entry tube is so positioned that it is in advance of the driving end or tip 17a of the shank 17 when the body 1 and the adaptor 2 are at the "second" position relative to each other, i. e., when they are at the position at which the shank is retracted. As the tip 17a of the shank is caused to advance due to relative movement of the body and of the adaptor from the second position towards the first position, the tip 17a will engage the free end of the blade 11 and will deflect it to close the exit end of the entry tube 6. Consequently, when a fastener is being driven it is impossible for another fastener to enter the housing and thus cause damage.

The valve assembly 3 comprises a sleeve 19 which provides a chambered element; the chamber is closed at its lower end and there is an opening 20 at its upper end which provides a valve seat. A fitting 21 is provided to connect the chamber by suitable tubing through a source of pneumatic pressure to the control relay of the server mechanism. Within the chamber is a ball 22 urged towards its seat by a compression spring 23.

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Holding the ball away from its seat is a pin 24 of lesser diameter than the opening 20 through which it extends and which is fast on the stop bar 15 and hence is secured to the body 1 through the rod 14.

The valve assembly 3 which is illustrated is for use with a fastener serving machine the cycle of operation of which is initiated by the closing of a bleed valve. Such a fastener serving machine is shown and described in the above-mentioned Patent No. 2,754,860, and reference should be made thereto for a detailed description. Components of a serving machine are shown diagrammatically in the drawing accompanying this application and include a compressed air circuit which is connected at 35 to a suitable source of compressed air, not shown. A conduit 36 delivers air to the air motor of the driving tool and a further conduit 37 connects a master valve 38 to the source of compressed air. Further conduits 39 and 40 connect the master valve 38 with a dispensing mechanism 41 which is operable to dispense fasteners one by one into a shuttle 42. A conduit 43 connects a valve 44 to the supply of compressed air, the valve 44 being connected to the shuttle 42 by a conduit 45; a further conduit 46 extends from the shuttle 42 to the entry tube 6 of the head. Finally, a conduit 47 connects the master valve 38 with the fitting 21 of the valve assembly 3.

Operation of the dispensing device 41 is effected by admitting compressed air into the conduits 39 and 40 alternately and the device delivers fasteners to the shuttle 42 whence they may be blown down the conduit 46 by compressed air by the operation of the valve 44; the compressed air chases the fastener into the entry tube 6. The master valve 38 is controlled by the opening and closing of a bleed valve constituted by the ball 22 and the seat in the opening 20. Operation of the bleed valve controls the master valve 38 which in turn operates the dispensing mechanism 41; the dispensing mechanism controls the operation of the valve 44 so that on closing of the bleed valve a fastener will be dispensed to the shuttle 42 and will be blown from the shuttle along the conduit 46 into the entry tube 6.

When the driving tool is thrust forwardly towards the body 1 to drive a fastener, the sleeve 19 moves relative to the pin 24 and eventually the pin is withdrawn from within the sleeve. The compression spring 23 in co-operation with the air pressure from the conduit 47 connected to the fitting 21 causes the ball 22 to bear on the seat 20, thus blocking the escape of air and actuating the master control valve 38 of the fastener serving machine. Thus the cycle of operation of the fastener serving machine automatically is initiated in synchronism with the driving of a fastener; when the driving tool is disengaged from the work, the pin 24 returns to its normal position forcing the ball 22 away from its seat thus opening the bleed valve and causing the master control valve 38 to return to its previous condition.

The means to prevent delivery of a second fastener into the chamber of the body 1 before the fastener previously delivered has been ejected, is constituted by a pawl and ratchet mechanism subsequently described. Within an opening 25 is a pawl 26 pivotally mounted on a pin 27 and which is urged to a neutral or transverse attitude by a tension spring 28. It will be noted that the distance between the edge of the rod 14 adjacent the pawl and the pivoting axis of the pawl is less than the distance between the said axis and the tip of the pawl, so that the pawl normally has a tilted attitude relative to a line perpendicular to the rod 14; the spring 28 causes the tip of the pawl to bear against the rod 14. On the rod 14 are a first or upper indent 29 and a sector or lower indent 30, intermediate which is a toothed indent or notch 31. The first indent is at a location on the rod 14 immediately forward of the pawl when the body 1 and the adaptor 2 are at the second position (as shown in the drawing), whilst the second indent is at a location

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on the rod immediately aft of the pawl when the body 1 and the adaptor 2 are at the first position. The indents 29 and 30 are of depths such that when they are in registration with the pawl, the pawl can freely pivot therein, the pawl when emerging from an indent due to relative movement of the body and of the adaptor assuming a trailing attitude relative to the sense of movement at the time of emerging.

In the position shown in the drawing, the pawl has just emerged from the indent 29 and it is in a trailing attitude relative to its immediately previous sense of movement. If the body 1 and the adaptor 2 are moved from the second position towards the first position by thrusting forwardly the driving tool and the shank 17 to advance them towards the body 1, the pawl will slide on the surface of the rod 14 without changing attitude until it registers with the indent 29 where it will assume a neutral or transverse attitude (relative to the axis of the rod 14) under the action of the tension spring 28. If the forward thrust is continued, the pawl on striking the lower shoulder of the indent 29 will tilt to point upwardly and will slide in that trailing attitude against the portion of the surface of the rod 14 between the indents 29 and 31. When the tip of the pawl registers with the indent 31 the pawl will maintain its trailing attitude, and as the forward thrust of the driving tool relative to the body continues, the pawl will slide on the portion of the surface of the rod 14 between the indents 31 and 30 until eventually it registers with the indent 30 and returns to neutral attitude. When a fastener driving operation has been completed and the body 1 is moved relative to the driving tool toward the "at rest" or second position, the pawl on striking the upper shoulder of the indent 30 will assume a downwardly pointing attitude, that is, a trailing attitude relative to its sense of movement, and it will maintain this attitude throughout the particular movement to finally assume the position and attitude shown in the drawing. In other words, if a complete cycle of operation of the driving tool is effected, the pawl will go through a sequence of positions and attitudes but without affecting the operation of the device.

However, should the operator only partially thrust forwardly the driving tool and then return the components to the "at rest" or second position without completing the cycle of operation, a different situation arises.

If the body 1 and the adaptor 2 are moved from the second position towards the first position only to an extent such that the pawl 26 is not brought into registration with the indent 31, the components can be returned to the "at rest" position in the normal manner. It will be noted from the drawing that the location of the indent 31 is so chosen that the pawl 26 will engage the indent 31 immediately prior to when the ball 22 contacts the valve seat 20. Consequently, so long as the pawl 26 has not engaged the indent 31, the cycle of operation of the serving machine will not be initiated; once the ball 22 has come into contact with the valve seat 20 to initiate the cycle of operation of the serving machine, the pawl 26 is in engagement with the indent 31. After the pawl 26 engages the indent 31, the body and the adaptor 2 cannot be returned to the "at rest" or second position without first thrusting the driving tool forwardly to a maximum extent so as to reverse the attitude of the pawl 26 by causing it to register with the indent 30. So long as the pawl 26 has an upwardly pointing attitude it will engage with the shoulder of the indent 31, and return movement of the parts to the "at rest" or second position is prevented. It will be apparent that when eventually the pawl 26 is caused to register with the indent 30, the body 1 and the adaptor 2 have been moved relative to each other to the first position so that the shank 17 has been thrust forwardly to its maximum extent and the fastener which was gripped in the collet is ejected.

Once the pawl 26 is caused to register with the indent

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31, the cycle of operation of the fastener serving machine will have been initiated due to the fact that the ball 22 has engaged its seat 20; consequently a fastener supplied by the fastener serving machine will have been delivered into the entry tube at this stage, but such fastener cannot enter the chamber of the body 1 because the blade 11 which was deflected by the shank 17 has closed the exit from the entry tube. It is only after the fastener which is held by the collet has been ejected therefrom and the shank is being returned to the "at rest" or second position that the blade 11 will clear the exit of the entry tube so that the next fastener can drop into position in the collet. It will also be apparent that when the cycle of operation of the fastener serving machine has been initiated, no further cycling is possible and the body 1 and the adaptor 2 cannot be returned to the second or "at rest" position until the driving tool has been thrust forwardly to a maximum extent (the first position) to eject the previously delivered fastener and simultaneously to cause a reversal of the attitude of the pawl 26.

In order to adjust the position of the indent 31 relative to the tip of the pin 24 to vary the instant of engagement of the pawl 26 with the indent 31 relative to the seating of the ball 22 on its seat 20, the rod 14 can be shifted longitudinally with respect to its mounting in the transverse extension 13 of the body 1. A set screw 32 is provided to secure releasably the rod 14 on extension 13. This feature compensates for differences in the height of the heads of various types of fasteners and also for variations in the overall lengths of the selected shanks 17 which may be used with the apparatus.

It is to be understood therefore that the form of the invention herein shown and described is to be taken as a preferred example of the same and that various changes in the shape, size and arrangement of the parts may be resorted to without departing from the spirit of the invention or the scope of the subjoined claims.

What we claim as our invention is:

1. A head for attachment to a fastener driving tool of the kind which includes a housing from which projects the driving end of a shank, comprising a body having a fastener receiving chamber which includes a passage for the reception through one end of the driving end of the shank of the driving tool, an entry tube on the body and having an exit end which opens into the chamber and another end for connection to a supply of fasteners, a blade in the chamber opposite the exit end of the entry tube, the said blade being normally biased to a guiding position where it provides a continuation of the entry tube and thus guides fasteners passing from the entry tube and into the chamber, the blade being swingable to a blocking position where it blocks the exit end of the entry tube, an adaptor member for firm attachment to the driving tool, interconnecting means between the body and the adaptor member enabling reciprocation of the adaptor member and thus of the attached driving tool relative to the body between a first position where the shank is advanced relative to the body and a second position where the shank is retracted, the exit end of the entry tube being so positioned that it is in advance of the driving end of the shank when the adaptor member and the body are at the second position, the shank moving the blade to blocking position when the adaptor member and the body are at positions other than the said second position, biasing means normally urging to the second position the adaptor member relative to the body, and a fastener guiding member on the body at the other end of the aforesaid passage to receive fasteners admitted into the chamber from the entry tube and to hold them one at a time in driving position and in alignment with the shank.

2. A head for attachment to a fastener driving tool of the kind which includes a housing from which projects the driving end of a shank, comprising a body having a fastener receiving chamber which includes a passage for

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the reception through one end of the driving end of the shank of the driving tool, an entry tube on the body and having an exit end which opens into the chamber and another end for connection to a supply of fasteners, an adaptor member for firm attachment to the driving tool, interconnecting means between the body and the adaptor member enabling reciprocation of the adaptor member and thus of the attached driving tool relative to the body between a first position where the shank is advanced relative to the body and a second position where the shank is retracted, biasing means normally urging to the second position and adaptor member relative to the body, a fastener guiding member on the body at the other end of the aforesaid passage to receive fasteners admitted into the chamber from the entry tube and to hold them one at a time in driving position and in alignment with the shank, and a stop arm on the body for engaging the head of a fastener held by the guiding member, the said stop arm preventing a fastener on which an external load is applied from being forced back into the chamber.

3. A head for attachment to a fastener driving tool of the kind which includes a housing from which projects the driving end of a shank, comprising a body having a fastener receiving chamber which includes a passage for the reception through one end of the driving end of the shank of the driving tool, an entry tube on the body and having an exit end which opens into the chamber and another end for connection to a supply of fasteners, an adaptor member for firm attachment to the driving tool, interconnecting means between the body and the adaptor member enabling reciprocation of the adaptor member and thus of the attached driving tool relative to the body between a first position where the shank is advanced relative to the body and a second position where the shank is retracted, biasing means normally urging to the second position the adaptor member relative to the body, a fastener guiding member on the body at the other end of the aforesaid passage to receive fasteners admitted into the chamber from the entry tube and to hold them one at a time in driving position and in alignment with the shank, a stop arm having one end mounted for limited swinging movement on the body and having a free end extending through an aperture in the body and into the passage aft of the guiding member, and cooperating means of the stop arm urging it into a position where it may engage the head of a fastener held by the guiding member, the stop arm preventing a fastener on which an external load is applied from being forced back into the chamber, the cooperating means enabling the free end of the stop arm to be swung aside by a fastener to clear the passage as the fastener travels through the passage immediately prior to its reception by the guiding member.

4. A head for attachment to a fastener driving tool of the kind which includes a housing from which projects the driving end of a shank, comprising a body having a fastener receiving chamber which includes a passage for the reception through one end of the driving end of the shank of the driving tool, an entry tube on the body and having an exit end which opens into the chamber and another end for connection to a supply of fasteners, an adaptor member for firm attachment to the driving tool, interconnecting means between the body and the adaptor member enabling reciprocation of the adaptor member and thus of the attached driving tool relative to the body between a first position where the shank is advanced relative to the body and a second position where the shank is retracted, biasing means normally urging to the second position the adaptor member relative to the body, a fastener guiding member on the body at the other end of the aforesaid passage to receive fasteners admitted into the chamber from the entry tube and to hold them one at a time in driving position and in alignment with the shank, and control means responsive to the relative movement of the adaptor member and the body from the second position to the first position.

5. A head for attachment to a fastener driving tool of

the kind which includes a housing from which projects the driving end of a shank, comprising a body having a fastener receiving chamber which includes a passage for the reception through one end of the driving end of the shank of the driving tool, an entry tube on the body and having an exit end which opens into the chamber and another end for connection to a supply of fasteners, an adaptor member for firm attachment to the driving tool, interconnecting means between the body and the adaptor member enabling reciprocation of the adaptor member and thus of the attached driving tool relative to the body between a first position where the shank is advanced relative to the body and a second position where the shank is retracted, biasing means normally urging to the second position the adaptor member relative to the body, a fastener guiding member on the body at the other end of the aforesaid passage to receive fasteners admitted into the chamber from the entry tube and to hold them one at a time in driving position and in alignment with the shank, and control means responsive to the relative movement of the adaptor member and the body from the second position to the first position, the control means comprising a chambered element secured to the adaptor member and which is closed at one end and has an open valve seat at the other end, a ball in the chamber, the ball and the valve seat together constituting a bleed valve, means urging the ball towards the seat to close the valve, and a pin of a diameter appreciably smaller than the diameter of the opening in the valve seat and having one end secured to the body and its other end extending into the chamber to hold the ball away from its seat and thus to open the valve when the adaptor member and the body are at the second position, relative movement of the body and the adaptor member to the first position causing the pin to move relative to the chamber so that the ball will engage the seat and close the valve.

6. A head for attachment to a fastener driving tool of the kind which includes a housing from which projects the driving end of a shank, comprising a body having a fastener receiving chamber which includes a passage for the reception through one end of the driving end of the shank of the driving tool, an entry tube on the body and having an exit end which opens into the chamber and another end for connection to a supply of fasteners, an adaptor member for firm attachment to the driving tool, a rod connecting the body and the adaptor member, the said rod being firmly secured at one end to one of the body and the adaptor member and being slidably mounted relative to the other of the body and the adaptor member to enable reciprocation of the adaptor member and thus of the attached driving tool relative to the body between a first position where the shank is advanced relative to the body and a second position where the shank is retracted, biasing means normally urging to the second position the adaptor member relative to the body, and a fastener guiding member on the body at the other end of the aforesaid passage to receive fasteners admitted into the chamber from the entry tube and to hold them one at a time in driving position and in alignment with the shank.

7. A head for attachment to a fastener driving tool, of the kind which includes a housing from which projects the driving end of a shank, comprising a body having a fastener receiving chamber which includes a passage for the reception through one end of the driving end of the shank of the driving tool, an entry tube on the body and having an exit end which opens into the chamber and another end for connection to a supply of fasteners, an adaptor member for firm attachment to the driving tool, a rod connecting the body and the adaptor member, the said rod being firmly secured at one end to one of the body and the adaptor member and being slidably mounted relative to the other of the body and the adaptor member to enable reciprocation of the adaptor member and

thus of the attached driving tool relative to the body between a first position where the shank is advanced relative to the body and a second position where the shank is retracted, movement arresting means on the rod and on the component on which the rod is slidably mounted, the said means preventing reversal of the sense of movement of the body and the adaptor member relative to each other when they are being moved from the second position to the first position and have arrived at an intermediate position, disabling means to disable the movement arresting means when the body and the adaptor member arrive at the first position and thus enabling them to return to the second position, biasing means normally urging to the second position the adaptor member relative to the body, and a fastener guiding member on the body at the other end of the aforesaid passage to receive fasteners admitted into the chamber from the entry tube and to hold them one at a time in driving position and in alignment with the shank.

8. A head for attachment to a fastener driving tool of the kind which includes a housing from which projects the driving end of a shank, comprising a body having a fastener receiving chamber which includes a passage for the reception through one end of the driving end of the shank of the driving tool, an entry tube on the body and having an exit end which opens into the chamber and another end for connection to a supply of fasteners, an adaptor member for firm attachment to the driving tool, a rod connecting the body and the adaptor member, the said rod being firmly secured at one end to one of the body and the adaptor member and being slidably mounted relative to the other of the body and the adaptor member to enable reciprocation of the adaptor member and thus of the attached driving tool relative to the body between a first position where the shank is advanced relative to the body and a second position where the shank is retracted, movement arresting means on the rod and on the component on which the rod is slidably mounted, the said means comprising a pawl pivotally mounted on the aforesaid component and an indent on the rod, the indent seizing the pawl and preventing the body and the adaptor member from returning to the second position if they previously had moved a predetermined distance from the second position towards the first position but did not arrive at the first position, biasing means normally urging to the second position the adaptor member relative to the body, and a fastener guiding member on the body at the other end of the aforesaid passage to receive fasteners admitted into the chamber from the entry tube and to hold them one at a time in driving position and in alignment with the shank.

9. A head for attachment to a fastener driving tool of the kind which includes a housing from which projects the driving end of a shank, comprising a body having a fastener receiving chamber which includes a passage for the reception through one end of the driving end of the shank of the driving tool, an entry tube on the body and having an exit end which opens into the chamber and another end for connection to a supply of fasteners, an adaptor member for firm attachment to the driving tool, a rod connecting the body and the adaptor member, the said rod being firmly secured at one end to one of the body and the adaptor member and being slidably mounted relative to the other of the body and the adaptor member to enable reciprocation of the adaptor member and thus of the attached driving tool relative to the body between a first position where the shank is advanced relative to the body and a second position where the shank is retracted, movement arresting means on the rod and on the component on which the rod is slidably mounted, the said means comprising a pawl pivotally mounted on the aforesaid component and an indent on the rod, the indent seizing the pawl and preventing the body and the adaptor member from returning to the

second position if they previously had moved a predetermined distance from the second position towards the first position but did not arrive at the first position, means on the rod to avoid seizing of the pawl by the indent if the body and the adaptor member are moved to full distance from the second position to the first position, biasing means normally urging to the second position the adaptor member relative to the body, and a fastener guiding member on the body at the other end of the aforesaid passage to receive fasteners admitted into the chamber from the entry tube and to hold them one at a time in driving position and in alignment with the shank.

10. A head for attachment to a fastener driving tool of the kind which includes a housing from which projects the driving end of a shank, comprising a body having a fastener receiving chamber which includes a passage for the reception through one end of the driving end of the shank of the driving tool, an entry tube on the body and having an exit end which opens into the chamber and another end for connection to a supply of fasteners, an adaptor member for firm attachment to the driving tool, a rod connecting the body and the adaptor member, the said rod being firmly secured at one end to the body and being slidably mounted relative to the adaptor member to enable reciprocation of the adaptor member and thus of the attached driving tool relative to the body between a first position where the shank is advanced relative to the body and a second position where the shank is retracted, biasing means normally urging to the second position the adaptor member relative to the body, a fastener guiding member on the body at the other end of the aforesaid passage to receive fasteners admitted into the chamber from the entry tube and to hold them one at a time in driving position and in alignment with the shank, and control means responsive to the relative movement of the adaptor member and the body from the second position to the first position, the control means comprising a chambered element secured to the adaptor member and which is closed at one end and has an open valve seat at the other end, a ball in the chamber, the ball and the valve seat together constituting a bleed valve, means urging the ball towards the seat to close the valve, and a pin of a diameter appreciably smaller than the diameter of the opening in the valve seat and having one end secured to the rod and its other end extending into the chamber to hold the ball valve away from its seat and thus to open the valve when the adaptor member and the body are at the second position, relative movement of the body and the adaptor member to the first position causing the pin to move relative to the chamber so that the ball will engage the seat and close the valve.

11. A head for attachment to a fastener driving tool of the kind which includes a housing from which projects the driving end of a shank, comprising a body having a fastener receiving chamber which includes a passage for the reception through one end of the driving end of the shank of the driving tool, an entry tube on the body and having an exit end which opens into the chamber and another end for connection to a supply of fasteners, an adaptor member for firm attachment to the driving tool, interconnecting means between the body and the adaptor member enabling reciprocation of the adaptor member and thus of the attached driving tool relative to the body between a first position where the shank is advanced relative to the body and a second position where the shank is retracted, biasing means normally urging to the second position the adaptor member relative to the body, a fastener guiding member on the body at the other end of the aforesaid passage to receive fasteners admitted into the chamber from the entry tube and to hold

them one at a time in driving position and in alignment with the shank, movement arresting means to prevent reversal of the sense of movement of the body and the adaptor member relative to each other when they are being moved from the second position to the first position and have arrived at an intermediate position, and disabling means to disable the movement arresting means when the body and the adaptor member arrive at the first position and thus enabling them to return to the second position.

12. A head for attachment to a fastener driving tool of the kind which includes a housing from which projects the driving end of a shank, comprising a body having a fastener receiving chamber which includes a passage for the reception through one end of the driving end of the shank of the driving tool, an entry tube on the body and having an exit end which opens into the chamber and another end for connection to a supply of fasteners, an adaptor member for firm attachment to the driving tool, a rod connecting the body and the adaptor member, the said rod being firmly secured at one end to one of the body and the adaptor member and being slidably mounted relative to the other of the body and the adaptor member to enable reciprocation of the adaptor member and thus of the attached driving tool relative to the body between a first position where the shank is advanced relative to the body and a second position where the shank is retracted, a pawl pivotally mounted on the component on which the rod is slidably mounted, the distance between the pivoting axis of the pawl and the rod being less than the distance between the said axis and the tip of the pawl so that the pawl normally is tilted relative to a line perpendicular to the rod, a spring urging the tip of the pawl into engagement with the rod, a first indent in the rod at a location immediately forward of the pawl when the body and the adaptor member are at the second position, a second indent in the rod at a location immediately aft of the pawl when the body and the adaptor member are at the first position, the said indents being of such depths that when they are in registration with the pawl the pawl can freely pivot therein, the pawl when emerging from an indent due to relative movement of the body and the adaptor member assuming a trailing attitude relative to the sense of movement at the time of emerging, a notch intermediate the indents, the pawl engaging with the notch to arrest movement of the body and the adaptor member towards the second position if the indent with which the pawl had immediately previously registered was the first indent, engagement of the pawl and the notch having no arresting effect on the movement of the body and the adaptor member when they are being moved towards the first position, biasing means normally urging to the second position the adaptor member relative to the body, and a fastener guiding member on the body at the other end of the aforesaid passage to receive fasteners admitted into the chamber from the entry tube and to hold them one at a time in driving position and in alignment with the shank.

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Notice of Adverse Decision in Interference

In Interference No. 90,706 involving Patent No. 2,870,805, A. S. Zakrzewski, G. Ashby, Z. Daskiewicz and E. S. Moore, **HEAD FOR POWER OPERATED SCREW DRIVER**, final judgment adverse to the patentees was rendered July 26, 1960, as to claim 4.

[Official Gazette March 30, 1965.]

Notice of Adverse Decision in Interference

In Interference No. 94,314 involving Patent No. 2,870,805, A. S. Zakrzewski, G. Ashby, Z. Daskiewicz and E. S. Moore, HEAD FOR POWER OPERATED SCREW DRIVER, final judgment adverse to the patentees was rendered Jan. 8, 1965, as to claims 2 and 3.

[Official Gazette February 23, 1965.]