

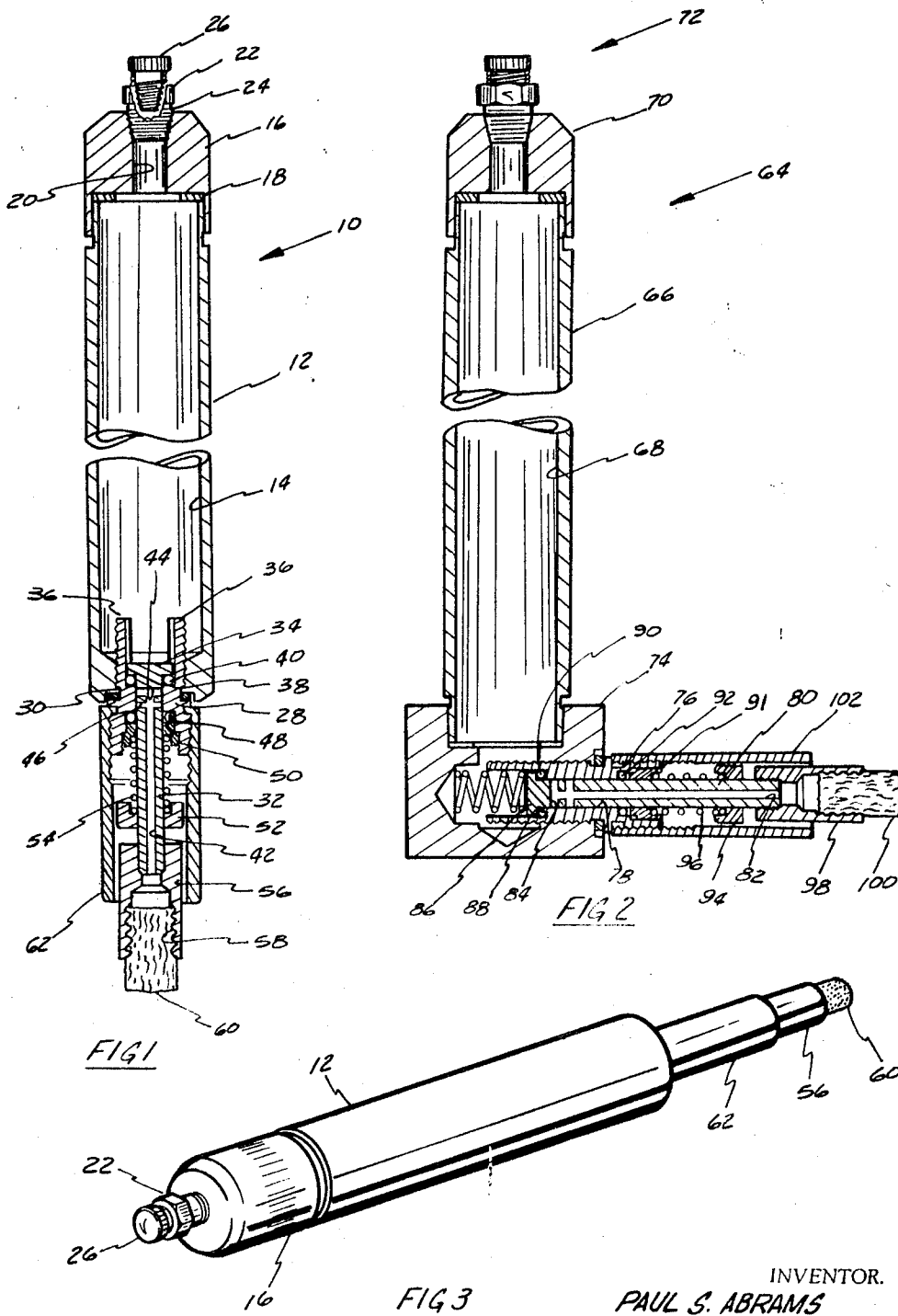
Aug. 5, 1969

P. S. ABRAMS

3,459,484

MARKING DEVICE

Filed May 1, 1967



INVENTOR.

PAUL S. ABRAMS

BY

Hauke, Kraus & Giffard
ATTORNEYS

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3,459,484

MARKING DEVICE

Paul S. Abrams, 25830 Berkley, Huntington Woods, Mich. 48070

Filed May 1, 1967, Ser. No. 635,215

Int. Cl. B43k 5/00; A46b 11/04; A47l 13/22

U.S. Cl. 401—206

8 Claims

ABSTRACT OF THE DISCLOSURE

A production marking device comprising a barrel with an ink reservoir, an elongated feed member having an axial passage with a transverse inlet and an outlet and mounted to the barrel for reciprocal movement in a variable stroke between a retracted position where the inlet registers with the reservoir to admit ink into the passage and an extended position where the inlet is sealingly shut off from the reservoir. A porous nib attached to the feed member adjacent the outlet of the axial passage receives a metered quantity of ink during a marking stroke which is proportional to the length of the stroke.

BACKGROUND OF THE INVENTION

Field of the invention

This invention relates to marking devices and more specifically to a production marking device for imprinting an ink reservoir, an elongated feed member having an loaded feed member arranged to open and close fluid communication between the ink reservoir and the nib during a marking stroke.

Description of the prior art

Marking devices for producing an ink color spot on metal parts in production lines are widely employed as a means for identifying the parts. Metal parts are best marked with an opaque, pigmented ink because of their highly visible characteristics. Some conventional marking devices for marking non-metal components, utilize a porous writing nib and a reservoir filled with an absorbent material for transferring the marking fluid from the reservoir to the writing nib. The problem with this arrangement in a high speed production lines is that the marking fluid can not be transferred from the reservoir to the marking nib in a sufficient quantity and at a rate to accommodate the high-speed marking cycle.

To overcome this ink transfer problem some marking devices of the prior art employed for marking metal parts utilize a felt marking nib attached to a feed member which is fluidly connected to a reservoir and with valve means arranged to discharge a metered quantity of fluid from the reservoir directly to the marking nib during each marking stroke. The problem with marking devices of the prior art which employ valve means is that pigmented inks cause such valves to clog, thereby reducing the flow from the reservoir to the marking nib. Instead of a uniform flow, the ink is transferred in blobs. It is a broad purpose of the present invention to provide a production marking device having improved, non-clogging valve means for opening and closing communication between the reservoir and the marking nib to channel a precise quantity of ink to the nib during each marking stroke.

SUMMARY OF THE INVENTION

The preferred embodiment of the present invention, which will subsequently be described in greater detail, comprises an elongated barrel having a vented cap at one end to permit filling of the reservoir and an outlet at the opposite end with an annular guide member having an annular seat mounted in the outlet. An elongated feed

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member having an axial feed passage is mounted for reciprocal movement in the guide means. The feed member has an enlarged head portion disposed within the reservoir which is normally biased toward the seat is a spring bias means with the feed member in an extended position.

A transverse marking fluid inlet is formed in the feed member adjacent the enlarged head and a nib holder for a felt nib is mounted on the extended end of the feed member for marking a horizontal surface. The transverse inlet is normally fluidly sealed from the ink reservoir when the feed member is in its extended position. When the nib is pressed in a marking stroke to produce an axial movement of the feed member toward a retracted position, the transverse inlet registers with the reservoir to admit a charge of marking fluid into the feed passage which channels it to the nib. When the pressing force on the nib is released, the feed member returns to its extended position to close off fluid communication between the feed passage and the reservoir.

By adjusting the stroke of the feed member, the quantity of marking fluid admitted into the feed passage for the nib can be very precisely controlled. The stroke is normally adjusted to accommodate the size of the nib and the speed of the production line.

An alternative embodiment of the invention contemplates a side marking device with a nib arranged to mark the vertical surface of a metal part. In this form of the invention, the axis of reciprocation of the feed member is at right angles to the axis of the barrel which is normally supported in an upright position with the refill cap and adjustable air vent means extending upwardly from the valve means.

The preferred marking devices provide a number of special advantages over ink marking devices of the prior art employing valve means for opening and closing communication between the ink reservoir and the marking nib. Each production part is marked uniformly, economically and without dripping between cycles. The precise quantity of ink metered during each marking stroke can be precisely adjusted. A maximum number of marks can be made with a minimum quantity of ink. The preferred marking devices provides from 2,000 to 4,000 1/2 inch marks per ounce of ink. The adjustable air vent in the barrel cap prevents vacuum lock during high-speed, long-run production marking. In addition, the improved marking device readily lends itself to a wide variety of actuating means, such as cams, air cylinders, manual methods and various remote signalling devices. The marking nib produces a mark on the initial stroke even after intervals of a half hour or more between strokes.

It is therefore an object of the present invention to provide a production marking device for marking metal parts with a pigmented ink and having a reservoir adapted to contain a marking fluid, means supporting a marking nib and valve means actuated by a marking stroke to open fluid communication between the reservoir and the marking nib, and close fluid communication between the reservoir and the nib at the completion of the marking stroke.

It is another object of the present invention to provide an improved ink marking device for high-speed production marking having a porous nib supported to a feed member for reciprocation along an axis in a marking stroke between positions wherein valve means open and close fluid communication between the feed member and a fluid reservoir to intermittently channel marking fluid to the nib.

It is still a further object of the present invention to provide a marking device comprising a barrel having a fluid reservoir adapted to contain a supply of marking fluid and a fluid outlet, guide means mounted in said fluid out-

let, and an elongated rigid feed member supported in said guide means for reciprocal movement, the feed member having an axial fluid passage connecting a transverse inlet and an outlet axially spaced from said transverse inlet, the feed member being movable between a retracted position wherein the transverse inlet registers with the reservoir to provide fluid communication between the reservoir and the feed passage, and an extended position wherein fluid communication between the reservoir and the feed passage is sealingly shut off.

Still further objects and advantages of the present invention will readily occur to one skilled in the art to which the invention pertains upon reference to the following detailed description.

DESCRIPTION OF THE DRAWINGS

The description refers to the accompanying drawings in which like reference characters refer to like parts throughout the several views and in which:

FIG. 1 is a longitudinal, sectional view through an ink marking device illustrating the preferred embodiment of the invention and adapted to mark a horizontal surface;

FIG. 2 is a transverse sectional view through a marking device adapted to mark a vertical surface and illustrating an alternative embodiment of the invention; and

FIG. 3 is a perspective view of the marking device of FIG. 1.

DESCRIPTION OF THE PREFERRED EMBODIMENTS

Referring to the drawings, a preferred marking device 10 is illustrated in FIG. 1 for marking a horizontal surface and comprises an elongated barrel 12 formed of a tubular section with the interior of the barrel defining a reservoir 14 for containing a quantity of a suitable marking fluid such as a pigmented ink. The upper end of the barrel 12 is closed off by a cap 16 which is threadably engaged to the barrel with an annular seal 18 providing a fluid type connection between the cap 16 and the barrel 12. An axial bore 20 through the cap 16 is closed off by a vent member 22 having an air vent 24 in communication with bore 20 and a valve member 26 engaged with the member 22 to control the quantity of air which is admitted into the reservoir. The valve 26 is normally adjusted so that the rate of air which is admitted accommodates the rate at which the marking fluid is consumed.

An annular valve body 28 is threadably engaged with the lower end of the barrel 12 and has an axial bore 30 functioning as guide means for an elongated feed member 32. The feed member 32 has an enlarged head portion 34 disposed within the reservoir 14 and which engages a pair of axially directed guide sections 36 so that the feed member 32 moves in an axial stroke.

The valve body 28 has an annular seat 38 at the upper end of the bore 30 arranged so that the head 34 moves toward and away from the seat 38. An annular seal 40 is disposed between the head 34 and the seal 38 to provide a fluid tight seal between the valve body 28 and the head 34 when the feed member is in its extended position.

The feed member 32 has an axial passage 42 extending from its lower end and terminating near its upper end with a transverse inlet 44. The transverse inlet 44 is formed below the head 34 and arranged so that when the feed member 32 is in an extended position, fluid communication between the reservoir 14 and the fluid passage 42 is shut off. However, when the feed member 32 is in the retracted position with the head 34 extended upwardly into the reservoir 14 to a position so that the inlet 44 registers within the reservoir 14, fluid communication is opened up between the reservoir 14 and the passage 42 to admit a quantity of marking fluid.

A second transverse inlet 46 is axially spaced from the transverse inlet 44 permits a greater charge of fluid to be admitted into the passage 42 when the stroke of the feed member 32 is such that the inlet 46 registers with the reservoir 14.

An annular seal 48 and a packing gland nut 50 provide a fluid tight seal between the lower end of the valve body and the feed member 32.

An adjusting nut 52 is threadably mounted on the feed member 32 and is movable toward and away from the packing gland nut 50 to a selected position defining the stroke of the feed member 32.

A helical compression spring 54 is wrapped around the feed member 32 and acts between the nut 50 and the adjusting nut 52 to normally bias the feed member 32 toward its extended position.

An annular nib holder 56 is threadably attached to the extended end of the feed member 32 and has an axial bore 58 which is preferably threaded at its lower end to engage a porous felt marking nib 60.

A cylindrical sleeve 62 is threadably engaged to the lower end of the valve body 28 and extends down a sufficient distance to function as a shield for the components between the nib holder 56 and the reservoir 12.

In operation, the feed member 32 is normally in its extended position illustrated in FIG. 1 between marking strokes and with fluid communication shut off between the reservoir 14 and the fluid passage 42. A marking stroke is initiated by pressure applied between the metal part which is to be marketed and the nib to produce an axial upward force on the feed member 32 which is retracted toward the reservoir 14 until the transverse inlet 44 registers with the reservoir 14. A quantity of fluid is admitted into the feed passage 42 which is channeled downwardly to the nib 60. Upon release of the pressure on the nib 60, the feed member 32 returns to its extended position so that fluid communication between the transverse inlet 44 and the reservoir 14 is sealingly shut off. Thus, fluid is only admitted into the feed passage 42 during a marking stroke. By adjusting the nut 52, the quantity of fluid admitted during a marking stroke into the feed passage 42 can be very precisely adjusted. In addition, by adjusting the air vent valve 26, the quantity of air admitted into the reservoir 14 to replace the fluid which is consumed during the marking operation can be controlled so that a vacuum is not created within the reservoir 14 to restrict a free flow into the passage 42.

Preferably, the components of the marking device 10 are made from suitable rust-proof materials such as aluminum and the like to provide a long and reliable marking life. The valve arrangement of the improved marking device is particularly adapted to accommodate pigmented ink since it does not become clogged when employing inks of this type as a marking agent.

FIG. 2 shows a marking device illustrating an alternative embodiment of the present invention for marking a generally vertical surface. The marking device 64 is similar to the marking device 10 and includes a barrel 66 having a reservoir 68 with its upper end closed off by a cap member 70. Air vent means 72 carried by the cap 70 admit air into the reservoir 68 in the manner described with reference to the marking device 10.

A right angle adaptor block 74 is threadably attached to the lower end of the barrel 66 and supports an annular valve body member 76 having an axial guide bore 78 for supporting an elongated feed member 80 for reciprocal movement along an axis perpendicular to the axis. The feed member has an axial feed passage 82 with an inner end terminating at a transverse inlet 84. Inlet 82 is movable toward and away from positions opening and closing fluid communication with the reservoir 68. An enlarged head 86 of the feed member 80 acts against an annular seat 88 with an annular seal 90 mounted on valve body 76 to define the fully extended position of feed member 80.

An annular packing gland nut 91 threadably engaged with the valve body 76 retains an annular seal 92 in a position to provide a fluid tight seal between the feed member 80 and the valve body 76 as the feed member reciprocates in a marking stroke. An adjustable nut 94 threadably mounted on the feed member 80 retains a

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helical compression spring 96 which is wrapped around the feed member 80. The spring 96 acts between the nuts 91 and 94 to normally maintain the feed member 80 in an extended position.

An annular nib holder 98 attached to the extended end of the feed member 80 carries a porous marking nib 100.

An elongated tubular sleeve 102 engaged to the valve body 76 acts as a shield for the components of the marking device between the adaptor block 74 and the nib holder 98.

In operation, the marking device 64 functions in a manner essentially similar to the operation of the marking device 10. A pressure applied on the nib 100 moves the feed member 80 in an axial stroke toward the left until the head 86 is unseated and the transverse inlet 84 is fluidly registered within the reservoir 68 to admit a predetermined quantity of marking fluid into the feed passage 82. The passage 82 channels the marking fluid to the nib 100 wherein the fluid is marked on the metal part which is to be identified. Upon release of the axial pressure on the nib 100, the feed member 80 returns to its extended position so that fluid communication between the reservoir 68 and the feed passage 82 is sealingly shut off as the head 86 is seated against the annular seal 90. By adjusting the nut 94 the quantity of fluid admitted from the reservoir 68 to the nib 100 during each marking stroke can be precisely adjusted.

Although I have described but two preferred embodiments of my invention, it is to be understood that various changes and revisions can be made therein without departing from the spirit of the invention as expressed in the scope of the appended claims.

I claim:

1. A marking device, comprising:

- (a) a housing defining a fluid reservoir adapted to contain a supply of marking fluid and having a fluid outlet;
- (b) a valve body mounted in said fluid outlet having a bore which constitutes a guide means and a counterbore extending into said reservoir, said valve body having an opening connecting said reservoir with said counterbore, said bore and counterbore forming a valve seat at their union,
- (c) a feed member supported in said guide means for reciprocal movement along an axis, said feed member having an axial fluid pasageway connecting a transverse inlet and an outlet axially spaced from said transverse inlet, said feed member being axially movable between a retracted position wherein said transverse inlet registers with said reservoir through said opening to open fluid communication between said reservoir and said fluid passage, and an extended position wherein fluid communication between said transverse inlet and said reservoir is sealingly closed;
- (d) an enlarged head portion on said feed member engageable with said valve seat for limiting the extended position of said feed member and seal means

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disposed intermediate said enlarged head portion and said valve body to seal said reservoir from said transverse inlet when said feed member is in an extended position.

2. The marking device as defined in claim 1, wherein the quantity of marking fluid admitted into said feed passage during a marking stroke is a function of the length of said stroke, and including means for varying the stroke of said feed member.

3. The marking device as defined in claim 2, wherein said guide means includes an abutment portion and including a stop member mounted on said feed member and movable to a selected axial position with respect to said abutment portion to vary the stroke of said feed member.

4. The marking device as defined in claim 3, and including a nib holder mounted on said feed member adjacent said outlet, said nib holder having an axial bore forming an axial extension of said fluid passage and adapted to retain a portion of said nib within said bore.

5. The marking device as defined in claim 1, wherein said fluid reservoir means comprises an elongated tubular section symmetrically formed about an axis and said feed member is supported for reciprocal movement about an axis perpendicular to the axis of said tubular section.

6. The marking device as defined in claim 5 wherein the end of said tubular section opposite said outlet has a cap member provided with adjustable air vent means.

7. The marking device as defined in claim 1 and including a holder member mounting said marking nib to said feed member, a tubular member fixed to said housing and extending axially to encompass said feed member, said holder member and said marking nib for a portion of the axial length thereof, said tubular member being radially spaced from said marking nib and said holder member being provided with an end portion which disposed intermediate said marking nib and said tubular member.

8. The marking device as defined in claim 1 in which said marking nib, and said feed member move axially at substantially a right angle with respect to said housing.

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BILLY J. WILHITE, Primary Examiner

ROBERT I. SMITH, Assistant Examiner

U.S. Cl. X.R.

401—235, 260, 272, 276

UNITED STATES PATENT OFFICE
CERTIFICATE OF CORRECTION

Patent No. 3,459,484 Dated August 5, 1969

Inventor(s) Paul S. Abrams

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

IN THE SPECIFICATION

Column 1, line 29, delete "reservoir, an elongated feed member having an" and insert therefore

--spot on a metal workpiece and having a spring--.

IN THE CLAIMS

Claim 1, line 42 delete "body"

Claim 7, line 36, following "which," insert

--is--.

SIGNED AND
SEALED
MAY 19 1970

(SEAL)

Attest:

Edward M. Fletcher, Jr.
Attesting Officer

WILLIAM E. SCHUYLER, JR.
Commissioner of Patents