Here insert (in full) Name or Names of Applicant or Applicants, followed by Address (s).

Name or Names of Applicant or Applicants: USM CORPORATION.

Address: 426 Colt Highway, Farmington, Connecticut 06032, United States of America.

We hereby apply for the grant of a Patent for an invention entitled: POINTING MACHINE, which is described in the accompanying complete specification. This application is a Convention application and is based on the application numbered 75,744 for a patent or similar protection made in United States of America on 14th September 1979.

Our address for service is Messrs. Edw.d. Waters & Sons, Patent Attorneys, 50 Queen Street, Melbourne, Victoria, Australia.

Dated this 15th day of September 1980.

Signature of Applicant (s) or Seal of Company and Signatures of its Officers as prescribed by its Articles of Association.

USM CORPORATION
Louis C. Gebhardt

To: THE COMMISSIONER OF PATENTS.
COMMONWEALTH OF AUSTRALIA

DECLARATION IN SUPPORT OF A CONVENTION
APPLICATION FOR A PATENT OR PATENT OF ADDITION

In support of the Convention Application made by USM CORPORATION

(hereinafter referred to as the applicant) for a Patent

for an invention entitled: Pointing Machine

I, VINCENT AUGUSTUS WHITE, Elliott Street, Beverly, County of Essex, Commonwealth of Massachusetts 01915, United States of America
do solemnly and sincerely declare as follows:

1. I am authorised by the applicant for the patent
to make this declaration on its behalf.

2. The basic application as defined by Section 141 of the Act was made in the United States of America

on the 14th day of September 1973, by EDWIN JOHN SKIERSKI

(Erin) (xx) (xx)

3. The said EDWIN JOHN SKIERSKI, 106 Tammie Trail, Campbellsville, County of Taylor, Commonwealth of Kentucky 42718, United States of America

is the actual inventor of the invention and the facts upon which the applicant is entitled to make the application are as follow:

The applicant is the assignee of the said actual inventor

4. The basic application referred to in paragraph 2 of this Declaration was the first application made in a Convention country in respect of the invention the subject of the application.

DECLARED at Beverly, County of Essex, Commonwealth of Massachusetts U.S.A.

this 17th day of July 1980.

Vincent Augustus White
Senior Patent Attorney

Edw. Waters & Sons, Melbourne.
1. A machine for pinch-pointing screw blanks, said machine comprising a pair of dies for pinch-pointing screw blank shanks therebetween, means for supporting each screw blank so that successive blanks are presented to and pointed on the closing of said pair of dies, and characterized by a movable alignment member providing a pocket to receive the shank of said screw so supported so that when a blank is presented between the dies, the shank of the blank is held in the pocket to prevent it from slipping sideways out of alignment with said dies.
Complete Specification

Application Number: 62416/80

Class

Commonwealth of Australia
Patents Act 1952-69

USM CORPORATION

426 Colt Highway, Farmington, Connecticut 06032,
United States of America

EDWIN JOHN SKIERSKI

EDWD. WATERS & SONS,
50 QUEEN STREET, MELBOURNE, AUSTRALIA, 3000.

Complete Specification for the invention entitled:

POINTING MACHINE

The following statement is a full description of this invention, including the best method of performing it known to:
BACKGROUND OF THE INVENTION

(1) Field of the Invention

The present invention relates to machines for pinch pointing the pilot ends of metal screw blanks, and more particularly to an arrangement for holding the screw blanks in the machine as the blanks are pointed.

(2) Prior Art

It was the practice, in the prior art screw manufacture, to machine the cutting edges in the pilot end of a screw blank. It was a costly operation. Advances in the screw manufacture art introduced the use of dies to pinch or punch the cutting edges in screw blanks prior to their being threaded. Dies of this type are embodied in U.S. Patent Nos 3,395,603 and 3,398,413, both of which are assigned to the assignee of the present invention. The dies described therein are used on machines which utilize a process, wherein 300 to 700 screw blanks per minute may typically be fed to a rotating dial having notches in its periphery. The dial rotates with the blanks supported generally vertically in the notches, to successively bring the blanks between a pair of dies. A presser foot is activated to move radially inwards to keep the blank in its notch on the periphery of the dial, during the pinching operation. U.S. Patent 4,149,237, also assigned to the present assignee, defines an invention wherein the fastener shaft is prevented from being bent during the pinching operation by the utilization of an angularly arranged notch in the rotatable dial of the machine to counteract the normal squeezing and distortion of the fastener shaft. However, in all of the prior art machines, the pinch point may not always be aligned with the axis of the shaft, causing poor drilling
qualities therewith. The amount of point misalignment may be as much as $8^\circ$ off the axis of the shaft, depending on shaft length and diameter. Misalignment may also occur because it is almost impossible to consistently produce blank fasteners with straight shafts perpendicular to the underside of their heads in cold heading operation, which is the standard way blank fasteners are manufactured.

It is an object of the present invention to provide an improved pointing machine that will overcome the above-identified problems and pinch screw blanks without simultaneously causing a misalignment of the screw shaft with the pinch point.

There is provided according to the present invention a machine for pinch-pointing screw blanks, said machine comprising a pair of dies for pinch-pointing screw blank shanks therebetween, means for supporting each screw blank so that successive blanks are presented to and pointed on the closing of said pair of dies, and characterized by a movable alignment member providing a pocket to receive the shank of said screw so supported so that when a blank is presented between the dies, the shank of the blank is held in the pocket to prevent it from slipping sideways out of alignment with said dies.

The objects and advantages of the present invention will become more apparent when viewed in conjunction with the following drawings, in which:

Figures 1A, B and C are side views of a screw blank, a pinch pointed screw blank and a threaded screw, respectively, the first two showing the initial and final stages of operation on a screw blank of the present machine;

Figure 2 is a plan view of a portion of a machine
constructed according to the principles of the present invention;

Figure 3 is a partial side-elevational view of the machine; and

Figure 4 is a view taken along the lines IV-IV of Figure 2.

Referring to the drawings in detail, and particularly to Figure 1A, there is shown a screw blank 10 having an elongated shank or shaft 12 and a head 14. Each screw blank 10 also comprises a pilot end 16, which is opposite to the head 14. The head 14 may be provided with any convenient means for cooperating with a tool for turning the screw to effect insertion or withdrawal thereof.

The screw blanks 10 are processed in a pointing machine 30, generally of the type described in U.S. Patent 4,149,287, which is hereby incorporated by reference, portions of which are similar to the present pointing machine invention, which is partially shown in Figure 2. The pointing machine 30 comprises a generally horizontally arranged dial or disc 32, rotatably disposed on a shaft 34, which extends through the upper surface of the dial 32. The shaft 34 is attached to a frame portion 36 of the machine 30. The dial 32 is driven by an indexing mechanism, not shown, included on the machine 30. The machine 30 may also include a supply chute, not shown, and a lower retaining ring, also not shown, and an upper "C-shaped" retainer ring 41, disposed horizontally adjacent the dial 32, similar to that shown in the aforementioned patent.

The rotatable dial 32 has a plurality of generally axially disposed notches 44 arranged on its periphery. A longitudinally extending centering lever 46 is pivoted at its proximal end,
about an eccentric shouldered washer 48. The eccentric washer 48 is secured to the frame 36 by a through-bolt 50. The centering lever 46 has a U-shaped cut-out 52 at its distal end. The cut-out 52 mates with a second eccentric shouldered washer 54 which is adjustably secured to the frame 36 of the machine 30, by a bolt 56. The centering lever 46 has an inwardly facing edge 60 of generally linear configuration. The edge 60 also comprises an outwardly projecting curve 62, directed toward the center of the dial 32. At the midpoint of the edge 60, there is a notch 64, arranged to generally oppose, one at a time, the notches 44 in the dial 32. A tab 66, extends off of the distal end of the centering lever 46. A biased lever 70, shown in Figure 3, pivots about a shouldered washer 72, which is screwed to the bottom of the frame 36. The distal end of the biased lever 70 is in abutting engagement with the tab 66 on the centering lever 46. A stationary anchor pin 74 is attached to and extends off of the frame 36 on the side of the pointing machine 30, just beneath the tab 66. A second pin 76 is attached to and stands off from the biased lever 70. A biasing means such as a tension spring 78 is secured between the anchor pin 74 and the second pin 76.

A fixed die 80 and a reciprocating die 82 are arranged beneath the rotating dial 32, as described in the aforementioned U.S. Patent 4,149,287. The fixed die 80 is secured to the frame 36. A spacer 84 is insertably arranged between the fixed die 80 and the frame 36, and is firmly locked in place. The thickness of the spacer 84 is one-half the diameter of the shaft 12 of the particular side screw blank 10 being pinch pointed. The curvilinear spring loaded blank retainer ring 41, shown only in Figure 3, holds the screw
blanks 10 in their respective notches 44 against radial movement caused by centrifugal forces generated therein as the dial 32 rotates about the shaft 34.

In operation of the pinch pointing machine 30, a plurality of screw blanks 10 are guided down the supply chute, not shown, and are each received in one of the notches 44 as they successively rotate therepast. The screw blanks 10 are held in their curvilinear path as the disc 32 intermittantly rotates by the retainer rings, as partially shown in Figure 3. As each blank 10 in the dial 32 approaches the point of rotation between the dies 80 and 82, the shank 12 rubs against the outwardly projecting curve 42 on the biased centering lever 46. The centering lever 46, is caused thereby to pivot radially away from the center of the dial 32. As the blank 10 is caused to rotate to the proper location between the fixed and movable dies, 80 and 82, and is secured therebetween by the notch 64 in the centering lever 46 pressing the shaft 12 tightly against the notch 44 in the dial 32, the centering lever 46, biased by the spring 78, has been momentarily caused to pivot quickly towards the center of the dial 32, momentarily orienting the screw blank 10 properly between the dies 80 and 82, permitting the axis "A" of the blank 10 shown in Figures 3 and 4, to coincide with the pinch point defined by the fixed and movable dies 80 and 82 on the blank shank 12 therebetween. The centering plate 46, still biased towards the center of the dial 32, gives a slight push on the newly pinch pointed shank 12 towards the center of the dial 32, causing the blank 12 to be pushed off of the configuration of the fixed die 80. The movable die 82 is concurrently withdrawn and the intermittent rotation of the dial 32 causes a new screw blank 10 to be
pushed against the outwardly projecting curve on the centering plate 60, pushing it radially away from the dial 32, until the blank 12 is rotated to and suddenly secured between the opposing notches, 44 and 64. The constant bias on the centering plate 46 is provided by the interaction of the distal end of the biased lever 70 in abutting engagement with the distal end of the centering plate 46.

As the dial 32 rotates, the pinch pointed screw blanks 10 are caused to be ejected therefrom, similar to the manner described in the aforementioned patent, and collected in a bin, not shown, ready for further processing which finally produces a finished screw 90, as shown in Figure 1c.

The eccentric shouldered washer 48 permits adjustment in the location of the notch 62 to govern the tilt of the axis of the screw blank 10 in relation to the dies, 80 and 82, which might be necessary with screw blanks 10 having different shank diameters. The eccentric washer 54 arranged in the cutout 52 in the distal end of the centering plate 46 similarly permits adjustment of the notch 64 by governing the limits of radial shift available with respect thereto.

Thus there has been shown a pinch pointing machine having a mechanism which can properly secure screw blanks between a pair of dies, to permit the alignment of the axis of the screw blank with the proper pinch pointing center of the dies, and which mechanism may be easily adjustable to accommodate differing diameters of screw blanks, thus obviating the need for a plurality of dials of different thicknesses and centering levers with different notch configurations, which would otherwise be necessary to hold the screw blanks at the proper pre-selected angle and alignment during the pinch-pointing
operation.

It is intended that the appended claims are to be interpreted as exemplary only and not in a limiting sense.
THE CLAIMS DEFINING THE INVENTION ARE AS FOLLOWS:
1. A machine for pinch-pointing screw blanks, said machine comprising a pair of dies for pinch-pointing screw blank shanks therebetween, means for supporting each screw blank so that successive blanks are presented to and pointed on the closing of said pair of dies, and characterized by a movable alignment member providing a pocket to receive the shank of said screw so supported so that when a blank is presented between the dies, the shank of the blank is held in the pocket to prevent it from slipping sideways out of alignment with said does.
2. A machine as recited in claim 1, characterized in that said pair of dies comprises a fixed die and a movable die.
3. A machine as recited in claim 1, characterized in that said means for supporting screw blanks between a pair of dies comprises a notched rotary dial, and a curvilinear side guide.
4. A machine as recited in claim 1, characterized in that said alignment means comprises a pivotable member, having an edge which is in sliding engagement with said screw blanks held in said dial.
5. A machine as recited in claim 4, characterized in that said edge on said pivotable member extend toward said dial to cause said pivotable member to pivot away from said dial during a portion of the interaction between said screw blanks and said pivotable member.
6. A machine as recited in claim 4, characterized by the fact that a biasing means acts upon the distal end of said pivotable member to bias said pivotable member towards said dial.
7. A machine as recited in claim 4, characterized in that said pivotable member is adjustably secured to a frame portion of said machine by an eccentric washer.

8. A machine as recited in claim 4, characterized in that said pivotable member causes the axis of each of said screw blanks to be angularly aligned with respect to said dies prior to the pinching operation being performed between said dies.

9. A machine as recited in claims 7 or 8, characterized in that said pivotable member can be adjusted to maintain the axes of a variety of different diameter shafts of different screw blanks in alignment with the point formed by the pinch pointing dies.

10. A machine as recited in claim 7, characterized in that said fixed die has a changable spacer element between said frame portion and said die.

11. A machine as recited in claim 10, characterized in that the thickness of said spacer element is equivalent to one-half the diameter of the shank of the particular screw blank being pinch pointed.

DATED this 15th day of September 1980.

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