United States Patent [19]

Iskra

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[54] **COMBINATION SCREW AND SCREWDRIVER WITH AXIAL GUIDE SPIGOT**

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[51] **Int. Cl.**..... **B25b 15/02**

[58] **Field of Search** ..... 145/50 A, 50 D; 81/53.2

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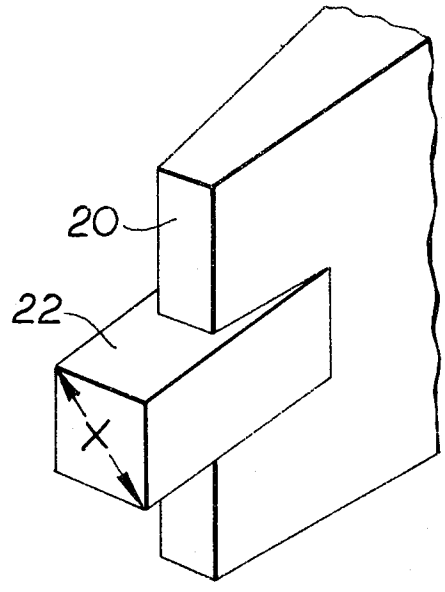
[57] **ABSTRACT**

For use with screws having a slotted head and a central axial bore, a screwdriver blade is provided with a diametral blade tip and a central guide spigot extending axially beyond the tip and of greater cross-section than the top width. The spigot, which may be cylindrical or of square cross-section, serves to maintain the screw in co-axial relationship with the screwdriver and prevents the blade slipping out of the slot in use.

The combination of a screw and screwdriver of the above type is described, preferably the spigot is of less length than the depth of the axial bore to prevent bottoming therein and, in the case of the square-section spigot it is sized to be a press fit in the bore so that the corners bite into the bore wall for more positive location.

5 Claims, 6 Drawing Figures



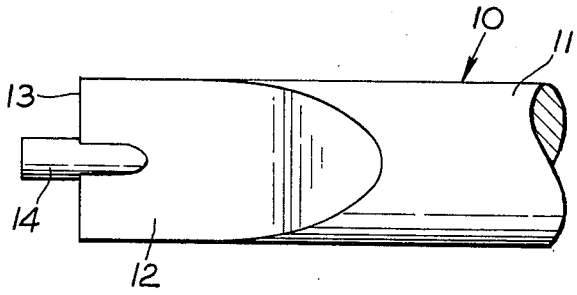


Fig. 1.

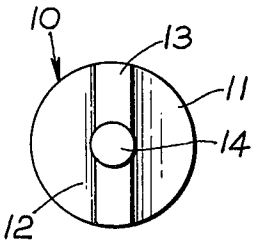


Fig. 2.

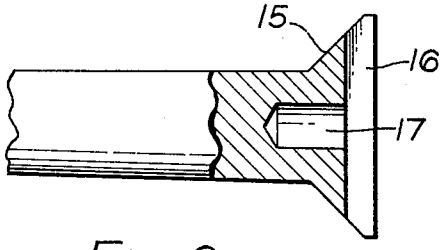


Fig. 3.

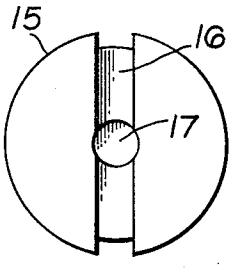


Fig. 4.

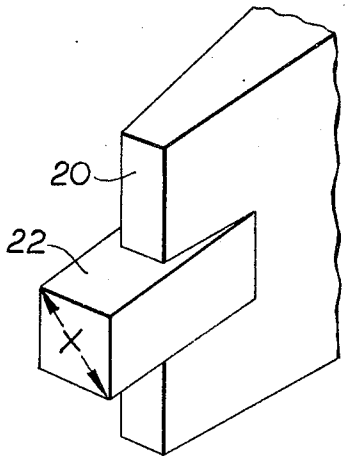


Fig. 5.

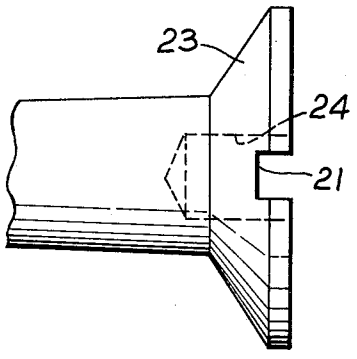


Fig. 6.

COMBINATION SCREW AND SCREWDRIVER WITH AXIAL GUIDE SPIGOT

This invention relates to screwdrivers and screws for use therewith, particularly hand screwdrivers, although it is contemplated that the invention also has application to screwdriver bits for use in power tools and automatic machines and the term "screwdriver blade" is used hereinafter to include such bits except where the context shows otherwise.

The disadvantages of the conventional flat bladed screwdriver used by engagement merely in a diametral slot of the screw head are well known, there is nothing to control axial alignment of the blade and screw, slipping can easily occur which may damage surrounding surfaces, and application of out-of-line torque or the use of incorrectly sized, worn, or inaccurately ground blades often causes damage to the screw, making the head unsightly and in some cases making its removal difficult or impossible. In order to overcome these disadvantages various modified forms of screw head and screwdriver have been developed, but in many cases these alternative arrangements give rise to other problems, for example the torque of the screwdriver blade may only be transmitted to a specifically shaped recess in a central zone of the head making damage due to excessive force more likely, the specialized blade shapes and head recesses are expensive to produce, and the shape of the recess usually precludes any application of a conventional screwdriver should the specialized blade be unavailable.

The object of the invention is to provide an improved screwdriver, and screws for use therewith, which is of particularly simple construction, yet which is effective in use in providing positive and safe driving engagement without risk of slipping, with transmission of maximum torque, and, in the case of the screws, without preventing use of a conventional flat blade.

A further object is to provide a screwdriver blade which comprises a straight edged diametrally extending blade tip for rotational driving engagement with a parallel-sided slot of a screwhead, and a central guide spigot projecting axially substantially beyond the blade tip and having a square lateral cross section substantially greater in width throughout its length than the width of said tip for engagement in an axial guide bore of the screw; said bore being of greater depth than the slot and of a constant diameter throughout its length, which diameter is greater than the width of the slot for mating engagement with the spigot of the screwdriver blade.

A preferred embodiment of the invention is now more particularly described with reference to the accompanying drawings wherein:

FIG. 1 is a side elevation of a screwdriver blade,

FIG. 2 is an end view thereof,

FIG. 3 is an axial section of a screw for use with the screwdriver of FIG. 1,

FIG. 4 is an end view of said screw,

FIG. 5 is a perspective view of the screwdriver blade, and,

FIG. 6 is a side elevation of the head of the screw.

Referring firstly to FIGS. 1 and 2, a screwdriver blade 10 has a cylindrical shank 11, one end of which (not shown) is releasably or permanently mounted in a handle for manual use, or is operatively engaged by a chuck or the like of a power tool. The acting end of

shank 11 is tapered to form a tip 12 having a transverse straight edge 13 extending across the full diameter of the shank in the manner of a conventional screwdriver blade; and on the axis of the shank there is provided a central square section guide spigot 14 projecting axially beyond the blade edge and having a width greater than the thickness of the tip 12 at the edge 13 as best seen in FIG. 5.

Screws for use with this screwdriver may have conventional head profiles, e.g., round, cheese-head, etc. FIGS. 3, 4 and 6 illustrate one example, a woodscrew having a countersunk head 15 which is provided with a transverse diametral slot 16 in the manner of a conventional screw (thus the conventional flat screwdriver blade can be employed if necessary although it is preferred to use the screwdriver of the invention). Head 15 is provided with a central axial cylindrical bore 17 whose diameter is somewhat greater than the width of slot 16 and which extends axially into the head to a distance preferably at least twice the depth of slot 16. Bore 17 has a diameter substantially equivalent to the diagonal cross-sectional dimension X of spigot 14 of the screwdriver blade, and the depth of bore 17 provides a slight clearance ensuring that spigot 14 does not "bottom" therein, to ensure that the blade edge 13 seats fully in the slot 16 in use.

The guide spigot 14 enables the screw to be carried on the blade into inaccessible positions which cannot be reached by hand. Moreover, spigot 14 positively maintains the screw in true co-axial alignment with the screwdriver shank 11 so that the screw is easily "started" at the desired angle with the workpiece (particularly in the case of woodscrews or self-tapping screws) and/or is easily correctly mated with existing threads in the workpiece if being driven into a pretapped bore. The screw can then be rapidly and positively driven home without special care or effort on the part of the user as the blade cannot easily be displaced from its engagement with the screw while axial pressure is being applied, thus misalignment and consequent damage is avoided.

Even when the screw has been driven home several times its head should remain unmarked and there will be no damage to surrounding surfaces. The risk of injury to an operator's fingers is also minimized.

It has been found in practice that the invention is particularly convenient in driving woodscrews home into wood-work rapidly and accurately in almost any situation as in the assembly of furniture and interior fitments, a "pump" type of screwdriver can be used without fear of slipping or damage. The invention may also facilitate the removal of tight or rusted screws.

Preferably, spigot 14 is very slightly tapered towards its free end and bore 17 is dimensioned to be a press fit thereon, thus when the screwdriver is first engaged with the screw, the corners of spigot 14 bite slightly into the wall of bore 17 and locate the screw positively on the end of the screwdriver blade, thus the screw may be carried on the blade into a position otherwise difficult of access without fear of the screw dropping off.

The square section spigot 14 facilitates manufacture of the screwdriver in that the machining necessary to provide a cylindrical spigot is avoided, and it can be forged or otherwise shaped by the same processes used to form the remaining parts of the blade tip.

As the guide bore of the screws may extend beyond the head into their shanks the dimensions are prefera-

bly chosen so that there is not excessive weakness at this point, the cross-sectional area of the screw material around or adjacent to the bore should be not less than the cross section of the material at the thread roots so that maximum strength is provided.

I claim:

1. The combination of a screw having a head including a transverse parallel-sided slot and a central axial cylindrical bore of greater depth than the slot and of constant diameter throughout its length, which diameter is greater than the width of the slot; and a screwdriver blade comprising a straight edged diametrally extending blade tip for rotational driving engagement with said slot and a central guide spigot porjecting axially substantially beyond the blade tip for operative entry into said axial bore and having a square lateral cross-section substantially greater in width throughout its length than the width of said tip for engagement in said axial bore, the diagonal of said spigot being substantially equal to the diameter of the axial bore, and said spigot being slightly tapered toward its free end and dimensioned to have a press fit in said bore, whereby the corners of said spigot are adapted to have biting engagement with the wall of said axial bore.

2. The combination according to claim **1** wherein the axial bore is somewhat greater in depth than the length of the spigot.

3. The combination according to claim **1** wherein the length of the axial bore is at least twice the depth of the slot.

4. The combination according to claim **1** wherein the cross-sectional area of the material of the screw around or adjacent to the bore is not less than the cross-sectional area of the material at the thread roots.

5. The combination according to claim **1** wherein the screw is a countersunk-headed woodscrew.

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