# United States Patent

Keymer

[15] 3,636,997

[45] Jan. 25, 1972


## [54] HACKSAW FRAME


[72] Inventor: Mark W. Keymer, Hopkins, Minn.

[73] Assignee: Malco Products, Inc., Minneapolis, Minn.



[22] Filed: June 29, 1970

[21] Appl. No.: 50,456

[52] U.S. Cl. ..... 145/33 A

[51] Int. Cl. ..... B27b 21/06

[58] Field of Search ..... 145/33 R, 33 A, 34 R



[56] References Cited

UNITED STATES PATENTS

| | | | |
|---|---|---|---|
| 2,399,869 | 5/1946 | Hough | 145/33 R |
| 2,612,196 | 9/1952 | Bouschor | 145/34 R |

FOREIGN PATENTS OR APPLICATIONS

| | | | |
|---|---|---|---|
| 970,770 | 6/1950 | France | 145/34 |
| 1,265,901 | 5/1961 | France | 145/34 |



*Primary Examiner*—Andrew R. Juhasz

*Assistant Examiner*—Michael Koczo, Jr.

*Attorney*—Williamson, Palmatier & Bains, H. Dale Palmatier, Herman H. Bains and Malcolm L. Moore

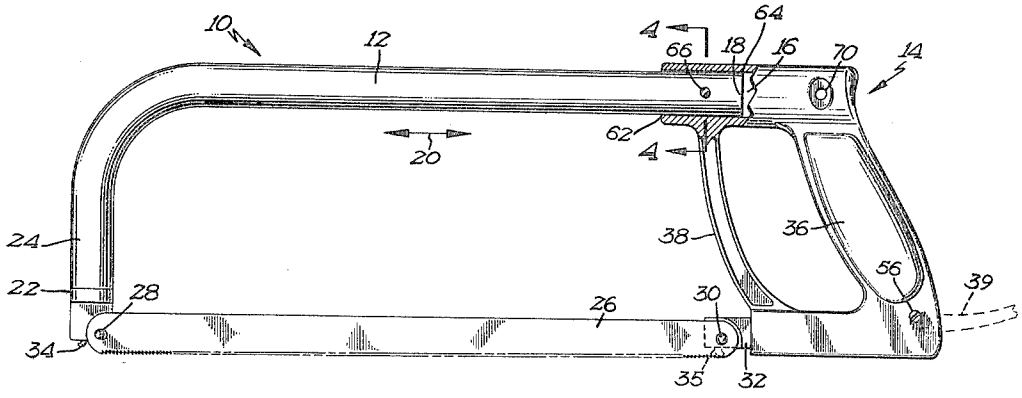


[57] ABSTRACT

A hacksaw frame with a frame arm telescopically adjustable within a socket in a handle assembly, the frame arm being locked in operating position within the socket and a blade simultaneously tensioned by a movable lever on the handle assembly. Moving the lever from an open to a locked position cocks and binds the frame arm within the socket thereby rigidly securing the hacksaw frame in operating position.

The purpose of the foregoing abstract is to enable the Patent Office and the public generally, and especially the scientists, engineers, or practitioners in the art who are not familiar with patent or legal terms of phraseology, to determine quickly from a cursory inspection the nature and essence of the technical disclosure of the application. The abstract is neither intended to define the invention of the application, which is measured by claims, nor is it intended to be limiting as to the scope of the invention in any way.


**3 Claims, 5 Drawing Figures**



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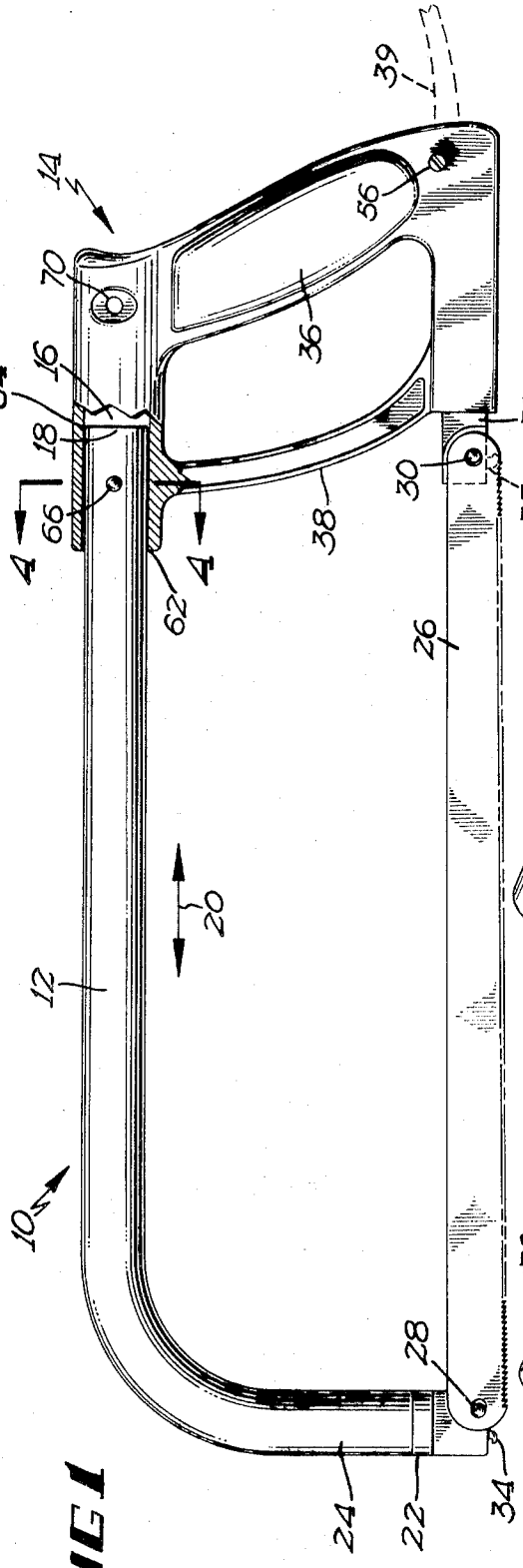



FIG 1

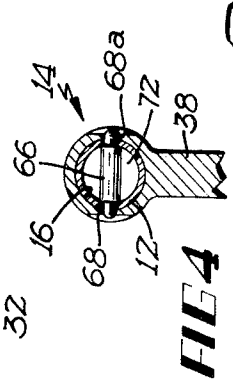



FIG 4

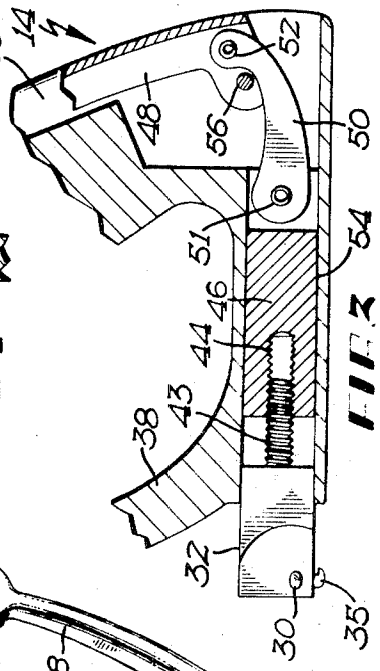



FIG 3

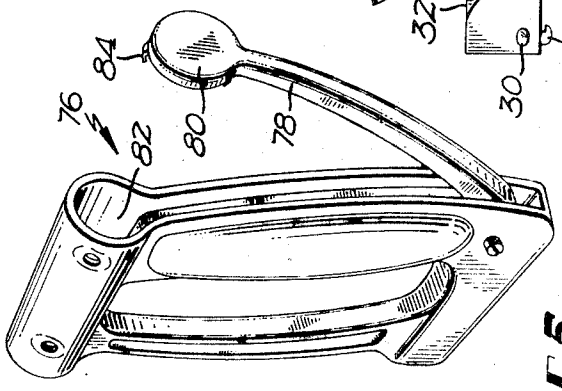
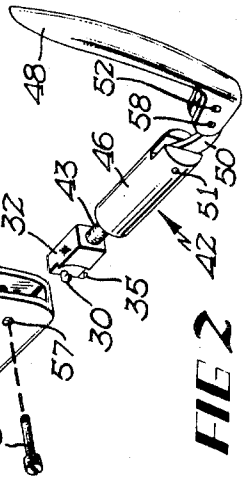



FIG 5



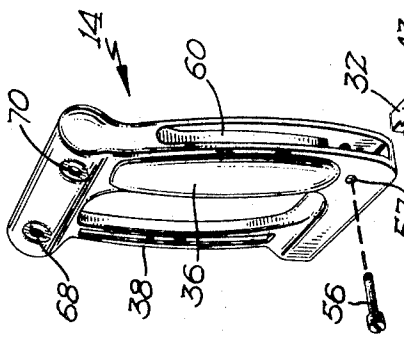




FIG 2

INVENTOR.
MARK W. KEYMER
BY
Williamson, Palmatier & Bains
ATTORNEYS

# HACKSAW FRAME

## BACKGROUND OF THE INVENTION

My invention comprises an improved hacksaw frame on which the required adjustments for inserting and replacing blades can be easily and rapidly made.

All hacksaw frames have the common purpose of providing a mounting frame for a blade. Once the blade is properly mounted, all hacksaws operate essentially the same regardless of differences in the frame construction. The effectiveness of a hacksaw frame is determined by the effort required to adjust the frame to blades of different lengths and the ease with which worn blades can be replaced.

An effective hacksaw frame requires an adjustable frame arm for blades of different lengths. Frame arms of most hacksaws are inconvenient and cumbersome to adjust. Often the arms adjust by sliding along and pivotally interlocking with a channel extending from the handle; the frame arm may carry a series of spaced transverse slots which are engageable with a stop on the channel to lock the frame arm in the channel. Frame arm length is adjusted by pivoting the frame arm at an angle to the channel to disengage the stop from the slot and then sliding the arm along the channel until the stop engages a new slot which locks the arm at the desired length. Unfortunately, this construction permitted the frame arm slot to easily disengage the stop and slip to an unwanted position if the hacksaw was bumped before the blade was tensioned. It was often necessary for an operator to hold the frame arm in proper position with one hand until the blade was inserted and tensioned. This was inconvenient because of the difficulty of inserting and tensioning a blade using only the remaining hand. My invention permits an operator to simultaneously lock the frame arm in position and tension the blade with a single, rapid, lever movement.

Another important consideration in hacksaw frame design is the ease with which blades can be removed and replaced when worn or broken. This seemingly simple operation is frequently time consuming and awkward with many hacksaw frames. Frequently when blade tension was released and the blade removed, the frame arm disengaged its stop and shifted to a new position thus requiring readjustment and relocking before a new blade could be inserted. Since it is frequently necessary to replace worn blades it is desireable that a hacksaw frame be designed for rapid removal and replacement of worn blades.

Few hacksaw frames include all the features necessary for rapid, easy adjustment of the frame arm length and quick replacement of worn blades while incorporating a compact, streamlined overall design. My invention substantially diminishes the problems described and is simple and fast to operate.

## SUMMARY OF THE INVENTION

My invention comprises an improved hacksaw frame having a frame arm which telescopes into and out of a socket in the handle assembly. A blade can be quickly inserted in my frame and the frame arm easily and rapidly adjusted to proper length. A lever assembly mounted on the handle assembly cocks and binds the frame arm in the socket and simultaneously tensions the blade when a lever is moved from an open to a locked position.

If desired, detents can be installed on the frame arm and socket to indicate appropriate frame arm positions for blades of known lengths. My detent device retains the frame arm in proper position while blades are changed and eliminates the frame arm readjustments commonly required with most hacksaw frames.

## BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a side view, partly in section, of a hacksaw frame embodying my invention.

FIG. 2 is an exploded view of the handle assembly of the frame of FIG. 1.



FIG. 3 is a sectional side view taken through the lower end of the handle assembly of FIG. 1.

FIG. 4 is a cross-sectional view of the handle assembly of FIG. 1 taken along cutting plane 4—4 showing my detent device and blade storage compartment.

FIG. 5 is a pictorial view of a handle assembly illustrating a modification of my invention.

## DESCRIPTION AND OPERATION OF THE PREFERRED EMBODIMENTS

My hacksaw frame invention, shown generally at 10 in FIG. 1, has a frame arm 12 and a handle assembly 14 containing a socket 16.

The frame arm 12 has its rearward end 18 slidably mounted in close fitting relationship with the socket 16 for movement in the directions indicated by arrows 20 to adjust the frame length for blades of different length. Frame arm 12 includes a blade mounting plug 22 at the forward end 24 of the arm.

A standard hacksaw blade 26 is held to the forward end 24 of arm 12 by a peg 28 on mounting plug 22. The outer end of the blade 26 is held by mounting peg 30 on blade mounting block or slide 32 which is a part of the adjustable connector. A second pair of mounting pegs 34 and 35 permit a blade to be mounted perpendicular to the blade position illustrated.

The handle assembly 14 has handle grips 36 and is provided with a guard 38 for protection of the operator. The handle assembly may be formed from a variety of rigid materials such as steel or aluminum.

Referring now to FIGS. 2 and 3, lever assembly or locking linkage 42 has the blade mounting block 32 with a screw 43 which engages threaded bore 44 (FIG. 3) in operating slide 46 which is also a part of the adjustable connector. Blade mounting block 32 and slide 46 collectively provide an adjustable connector for the lever assembly 42.

A lever 48 is pivotally joined to connector 46 through a linkage 50 by pins 51 and 52. The lever assembly 42 is here shown as including mounting block 32, connector 46, linkage 50, lever 48, and pins 51 and 52. The lever assembly 42 is slidably carried within a guide passage 54 (FIG. 3) at the base of the handle assembly 14. The lever assembly 42 is retained in the passage by pivot screw 56 (FIG. 1–3) which passes through bores 57 and 58 of the handle assembly and lever respectively, and is threaded to the handle assembly.

When lever 48 is moved from open position 39 (FIG. 1) to a locked position in recessed slot 60 (FIG. 3) the blade mounting block 32 moves along passage 54 a set distance. When in a locked position pin 52 is in an over-dead-center relationship relative to the line joining pin 51 to screw 56. The movement along guide passage 54 is ample to tension the blade 26 and cock and bind the frame arm 12 in socket 16 as will now be described.

The blade 26 is inserted and tensioned and frame arm 12 cocked in socket 16 by first placing the lever 48 in open position as shown at 39 (FIG. 1) and sliding the frame arm 12 to a position in socket 16 which spaces the mounting pegs 28 and 30 appropriately for the given blade. The blade is then inserted and the lever 48 moved to locked position in slot 60 (FIG. 3). This lever movement causes the blade mounting block 32 to slide rearwardly along guide passage 54 and exert a tensioning force on the blade 26 and an equal force on forward end 24 of frame arm 12. This force cocks arm 12 in socket 16 and binds the arm against the sides of socket 16 at 62 and 64 (FIG. 1) to thereby lock the arm firmly in the socket. The hacksaw is now ready for use.

The ease with which different size blades can be inserted in my frame can be increased by equipping my frame arm 12 and socket 16 with cooperating detent means. In FIG. 1 the frame arm 12 is shown with a spring-loaded detent device 66. The detent device 66 (FIG. 4) extends completely through the frame arm 12 and snaps into cooperating detent apertures 68 and 68*a* in the handle assembly. Two or more pairs of such apertures can be provided; FIGS. 1 and 2 show a first pair at

68 and a second pair at 70. To adjust the length of the frame arm 12 extending from socket 16, the arm is slid along socket 16 until the detent device 66 snaps into cooperating detent apertures at 68 or 70. When the detent device 66 engages one of these pairs of apertures the frame arm is the appropriate length for the particular blade. Even if the lever 48 is moved repeatedly or the frame jarred, the arm position remains constant thus increasing the ease of inserting and removing blades.

When a different size blade is to be inserted, the lever 48 is moved to open position, the old blade removed, the detent device 66 pushed inwardly at both of the apertures 68 and 68*a* (FIG. 4) and the arm 12 slid along socket 16 until the detent device 66 engages the next pair of apertures 70 (FIG. 1). This arm adjustment can be performed quickly and easily and once adjusted the detent device 66 keeps the arm in the desired position even when the saw is jarred or bumped. It should be understood that the detent device 66 is not needed to lock the arm 12 in the socket 16 so as to produce a rigid frame for cutting; the arm is locked in the socket by the cocking and binding action already described. The purpose of detent device 66 is to aid an operator in properly positioning the arm for conventional blades and to prevent the arm from slipping along or out of the socket 16 when a blade is being replaced.

It is helpful to form guide passage 54 with a square cross section to prevent the mounting block 32 from accidentally rotating and changing its adjustment when lever assembly 42 is in position in passage 54 with pivot screw 56 in place. Because of this construction the adjustable connector of the lever assembly 42 seldom requires adjusting when blades are removed or inserted.

When necessary to vary the length of lever assembly 42 in order to accommodate various commercial blades to the frame arm positions established by my detents, pivot screw 56 (FIG. 2) is removed and lever assembly 42 (FIG. 3) slid forwardly along passage 54 until mounting block 32 is outside passage 54. Mounting block 32 is rotated to advance or retract screw 43 in bore 44 thereby changing the length of the lever assembly, which can then be remounted in passage 54. The screw 56 may be formed with a knurled head for ease of removal.

Referring now to FIG. 4, frame arm 12 can be made from a tubular rod having a hollow interior 72. One or more extra blades can be stored within the interior 72 of the frame arm for use in the event the installed blade 26 becomes unusable. They can be inserted or removed from the interior 72 of the arm 12 by removing the arm from socket 16.

A modification of my handle assembly shown in FIG. 5 permits an operator to gain access to the blade storage compartment from the rear of the handle assembly 76. The lever 78 has a cap 80 designed to block an opening 82 at the upper rear side of the handle assembly. When the lever 78 is moved to an open position, an operator can insert or remove one or more extra blades. When the lever 78 is in locked position, retaining means shown at 84 engage the opening 82 and hold the lever 78 in locked position.

While I have described a preferred embodiment of the present invention, it should be understood that various changes, adaptations, and modifications may be made therein without departing from the spirit of the invention and the scope of the appended claims.

I claim:

1. A hacksaw for a blade comprising:

a frame including a forwardly extending frame arm and also including a rearwardly disposed handle connected to the arm,

means on the forward end of the frame arm for connection to a blade,

the frame having an elongate guide passage adjacent the handle and extending in a fore and aft direction toward said means, the guide passage having a noncircular transverse configuration,

an adjustable connector in said guide passage and including a blade mounting slide having the transverse cross section of the guide passage and having attachment means for connection to the blade, the slide projecting forwardly out of the guide passage, and being longitudinally slidable without rotation in the passage, the adjustable connector also including an operating slide in spaced relation with the blade mounting slide, and the connector also including a screw on one of the slides and threaded into the other of the slides for varying the spacing between the slides, and

a swingable linkage pivoted on the frame adjacent to the rear end of the guide passage and including a swinging link connected to the operating slide of the connector for producing fore and aft sliding thereof in the guide passage, said linkage being swingable toward and into locked position to move the operating slide rearwardly in the guide passage to a preset blade tensioning position, and said linkage also being alternately swingable away from said locked position and to a release position to move the operating slide forwardly in the guide passage to release tension on the blade and permit removal thereof and to move the blade mounting slide endwise out of the guideway to permit rotation thereof relative to the operating slide to effect adjustment along the screw and thereby accommodate variation in blade lengths.

2. The hacksaw according to claim 1 and said linkage including a link with a connection to the operating slide and also including a lever with connections to the frame and to said link, the connections being pivots swinging over center through a plane common to all pivot axes to the locked position wherein tension through the slides holds the linkage in locked position.

3. The hacksaw according to claim 2 wherein the frame arm is tubular and has a straight portion with an open rear end adjacent to the handle to receive and confine a spare blade therein, the lever of the linkage having a cover portion overlying the open rear end of the tubular frame arm and being held thereagainst by the tension on the blade acting through the slides and to hold the pivots in over center position.

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