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[54] **TOOL CARRIER CASE**
4 Claims, 8 Drawing Figs.

[52] U.S. Cl. **206/16,**
190/58, 206/45.18, 211/69, 220/31
[51] Int. Cl. **H45c 13/26,**
B65d 85/54
[50] Field of Search 206/16, 17,
16.5, 45.18, 65, 17.1; 211/69; 220/31 (S.R.);
190/58

[56] **References Cited**

UNITED STATES PATENTS

979,981	12/1910	Milke	206/17
1,919,811	7/1933	Stonebraker	206/16.5
2,260,086	10/1941	Matter	211/69
2,844,244	7/1958	Hanson	206/17
3,107,783	10/1963	Corey et al.	220/31(S.R.)
3,131,829	5/1964	Masser	220/104
3,367,483	2/1968	Studen	206/17

FOREIGN PATENTS

50,133	10/1909	Switzerland	206/45.18
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ABSTRACT: The two-section all-plastic case is molded in one piece, the flexible web hingedly connecting the two sections being integral therewith and subjected to flexing while still hot from the mold to be flexible thereafter without breakage for the life of the case. A latch plate is also molded integral with the top wall of one case section and its projecting portion carries two heated pins that have a snap fit in registering holes in the top wall of the other case section. A retractable and extensible handle straddles the latch plate so that the hand grasping the handle holds the latch plate in position preventing accidental opening. The tools are disposed in spaced parallel relation in both case sections with their square shanks entered in square sockets molded in parallel bars mounted lengthwise of the case sections with freedom to turn enabling easy removable and replacement of tools. The sockets in the bars are in staggered relation to enable nesting of the tools for most efficient use of the space available, without storing the tools too close together for easy handling. The bars are molded of polyethylene, which has compressability, resilience, and a certain slickness, and these characteristics combine to enable easy insertion and removal of the square shanks from the square sockets, which have longitudinal friction ribs on the four sides that have line contact on the four sides of the shanks, compression of these ribs combined with a certain amount of expansion of the material around each socket enabling a good hold on the shanks.

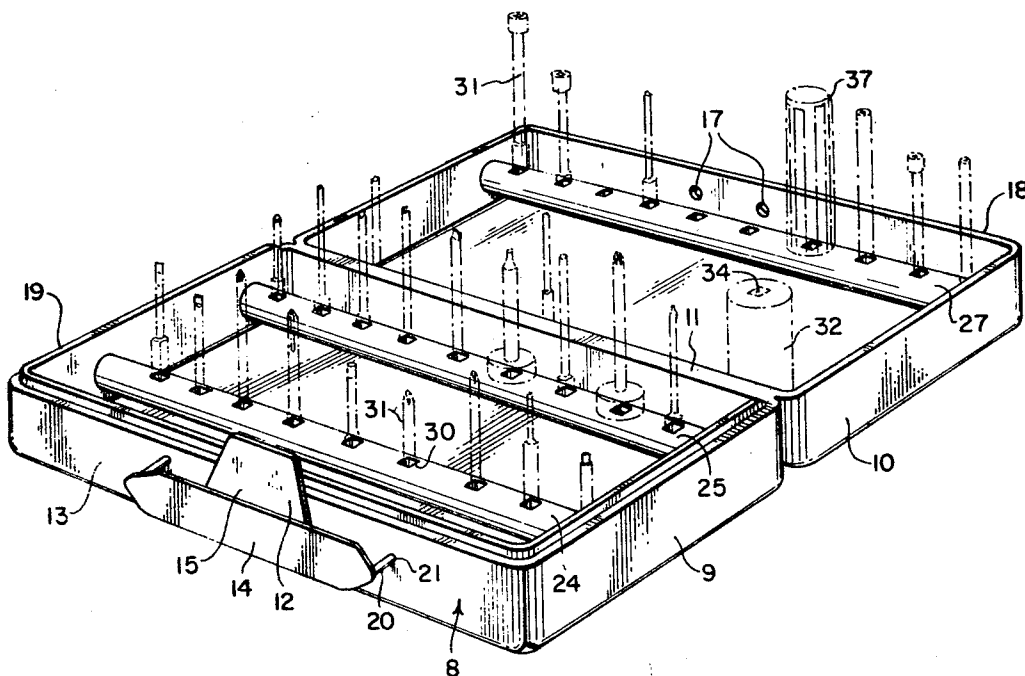


FIG 1

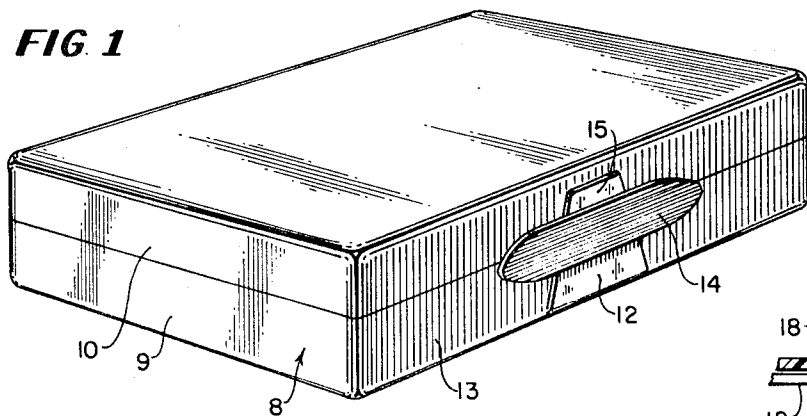


FIG 2a

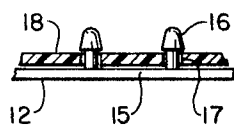


FIG 2

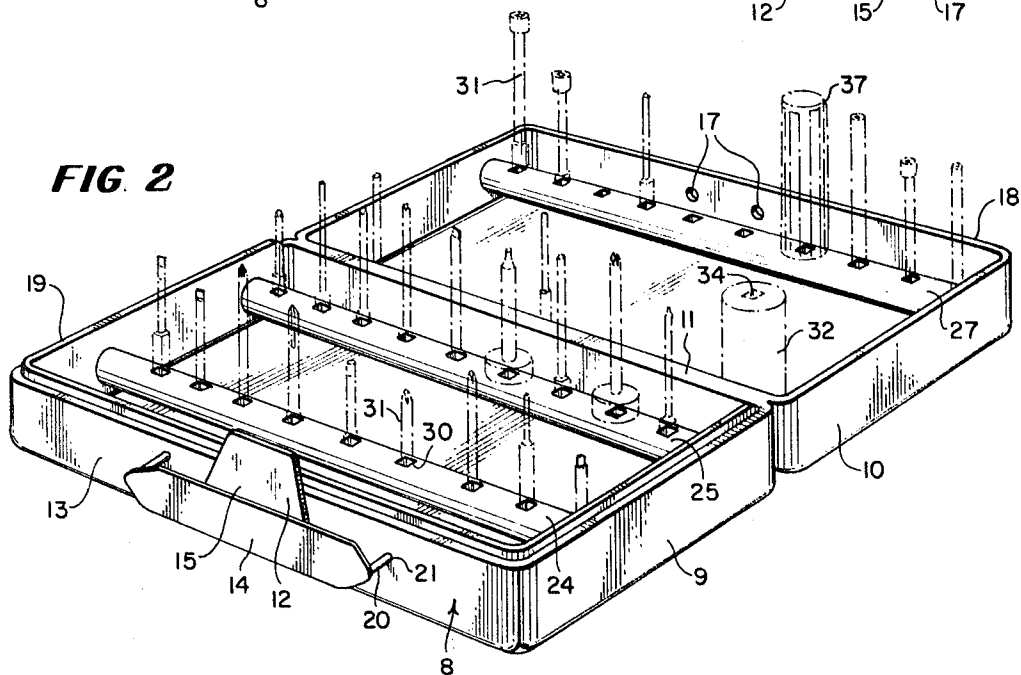


FIG 3

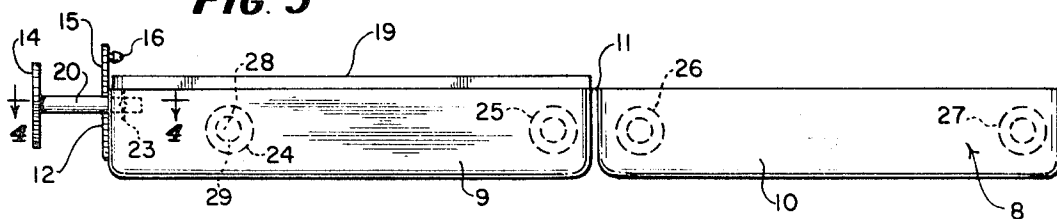
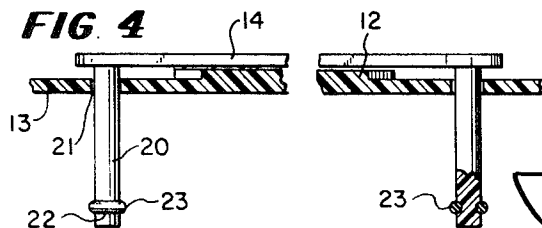


FIG 4



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FIG. 5

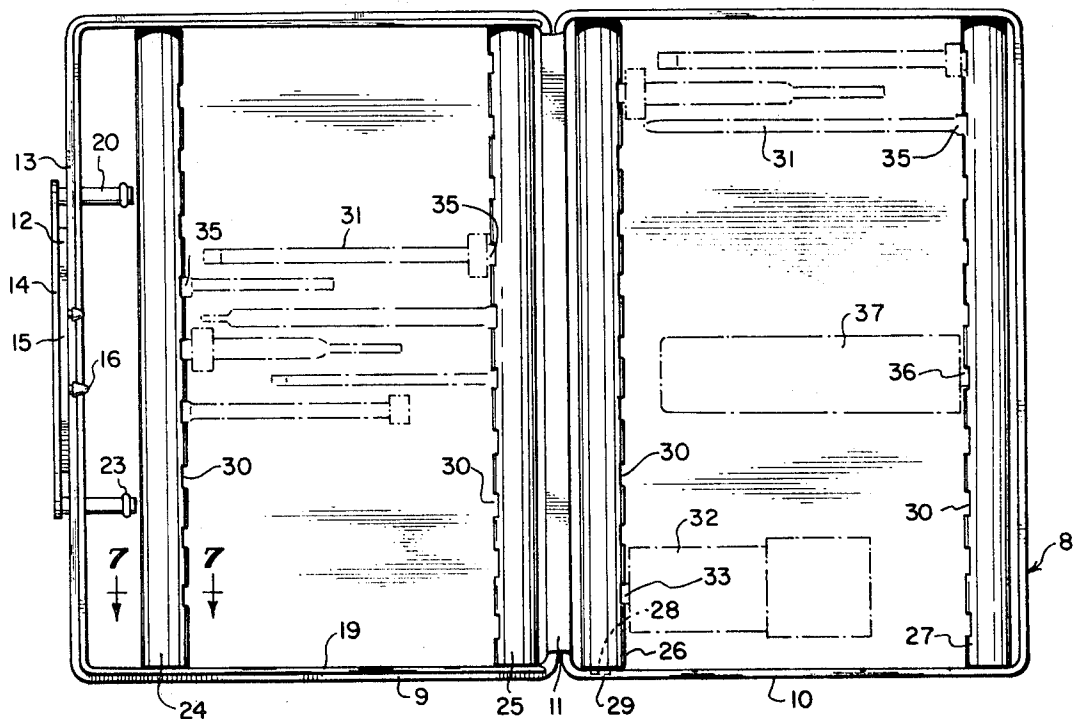


FIG. 6

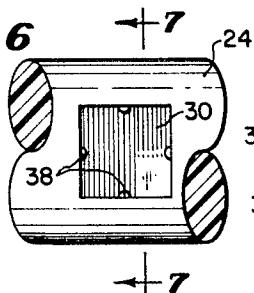
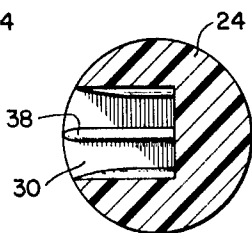


FIG. 7



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TOOL CARRIER CASE

This invention relates to a new and improved tool carrier case designed to accommodate a large assortment of screwdriver bits, wrenches, and other small tools having the same size and shape of drive shank to fit interchangeably in the same torque-applying tool device or a torque-measuring unit, the present carrier case embodying the following novel features:

(1) Spaced parallel plastic bars pivotally mounted at opposite ends in the hollow of each of the two hingedly connected plastic case sections, spaced far enough apart for reception of the longest tools therein, with the tool sockets in each pair of bars in staggered relation so that there is no interference and the tools nested in this fashion make the most efficient use of all of the available space, and, despite close proximity, of the tools on the bars, any tool can be removed and replaced quickly and easily;

(2) The tool holder bars, which are preferably of molded polyethelene, have square sockets in spaced parallel relationship in one side, each socket having longitudinally extending ribs at the middle of each side for resilient engagement with the four sides of the tool shanks, and each of the ribs being of gradually diminishing height toward the outer end for the easiest possible entry and removal of tools by virtue of the slickness of this particular plastic material when engaged by steel tools, combined with reliable holding power resulting from the right amount of give and resilience, which this particular plastic material possesses;

(3) The case, which is molded in one piece of polypropylene, with a thin flexible and durable web serving as the hinge connection, has the web subjected to flexing while still hot after completion of the molding, such handling of the web apparently rearranging the molecules of this section so that it may be flexed innumerable times as a hinge without cracking, in spite of the thinness of the section;

(4) The handle for the case on a pair of parallel rods having O-rings in annular grooves in their inner ends to limit the extension outwardly to operative position, this construction having the advantage that the handle is retractable for its best protection against damage when not in use and to make for more compact storage of the tool case, without sacrificing anything insofar as handiness in the use of the handle generally is concerned;

(5) A novel latch plate is molded integral with the case of polypropylene and has a free end portion projecting from one section of the case under the handle and flexible with respect to this section enough to permit entering the rounded heads on two pin projections into registering holes provided in the corresponding wall of the other case section, there being a snap fit of the heads in these holes for secure enough connection while still permitting reasonably easy unlocking by flexing the latch plate outwardly, and

(6) The novel construction and arrangement of the latch with respect to the retractable handle is such that there is no likelihood of the latch opening while the case is being carried, as the fingers holding the handle serve at the same time to hold the latch in locked position.

The invention is illustrated in the accompanying drawings, in which:

FIG. 1 is a perspective view of the tool carrier case of my invention;

FIG. 2 is a perspective view of the carrier case shown opened, with the tool carrier bars turned through 90° to show how the tools are thereby made easily accessible for removal and replacement;

FIG. 2a is a sectional detail of the latch plate;

FIG. 3 is an end view of FIG. 2;

FIG. 4 is a section on the line 4-4 of FIG. 3, on an enlarged scale;

FIG. 5 is a plan view of the case when opened showing all of the tool holder bars in the initial position to illustrate the nesting of the tools for most efficient use of the space available in both sections of the case, and

FIGS. 6 and 7 are a side elevation and end section, respectively, of a socket portion of one of the tool holder bars on an enlarged scale, the section being taken on the line 7-7 of FIGS. 5 and 6.

The same reference numerals are applied to corresponding parts throughout the views.

The reference numeral 8 designates the tool carrier case of my invention, which, as I have indicated above, has its two generally rectangular interfitting sections 9 and 10 molded in one piece of polypropylene, with an integral thin flexible web 11 forming the hinge connecting the two sections, and with a latch plate 12 molded integral with the top wall 13 under the handle 14, the flexible outer end portion 15 of the latch plate, which carries a pair of parallel laterally spaced headed pins 16 aligned with a pair of holes 17 in the top wall 18 of the other section 10, having the tapered and rounded heads of the pins 16 received in the holes 17 with a snap fit, as shown in FIGS. 2a, for a good and secure fastening and yet one that will permit unlocking of the case easily enough by outward flexing of the latch plate 12. A flange 19 projects from three sides of the case section 9 and fits snugly inside case section 10 when the carrier case is closed.

The handle 14, which is also suitably molded of polypropylene, has parallel pins 20 integral with opposite ends slidably received with a close fit in holes 21 provided in the top wall 13 on opposite sides of the latch 12, and these pins have annular grooves 22 molded in their inner end portions, as best seen in FIG. 4, to receive with a tight snap fit the O-rings shown at 23 that serve to limit outward movement of the pins 20 when the handle 14 is extended for use, as shown in FIGS. 2 and 3. In the operative position of the handle 14, the fingers of the hand grasping the handle engage the latch plate 12 and thereby prevent the flexible end portion 15 from flexing outwardly and withdrawing the headed pins 16 from the holes 17, and consequently, there is no danger of the latch opening accidentally while the case is being carried. When the carrier case is closed and in storage, the handle 14 can be slid on its pins 20 to a retracted position to save space and at the same time eliminate likelihood of any damage being done to the handle by coming into contact with some heavy object thrown into place alongside the carrier case in the storage space.

Four cylindrical plastic tool holder bars 24-27 are mounted two in each of the case sections 9 and 10 in spaced parallel relationship to one another, each having reduced concentric cylindrical end portions 28 received with a snug rotary fit in a cylindrical recess 29 provided therefor in the adjoining end wall of the case section, as best appears in FIG. 3. These tool holder bars have square sockets 30 molded therein in equally spaced relation for reception of square shanks on various tools like those indicated in dot-and-dash lines in FIG. 2 and 5. The sockets 30 in one bar 24 of a pair are in staggered relation to sockets 30 in the other bar 25 of the same pair, the same being true in relation to bars 26 and 27, the purpose being to enable nesting the tools, as shown in FIG. 5, for most efficient use of the storage space available in each of the case sections. Of course, when larger tools, like those shown at 32 and 33 are carried, the arrangement of the sockets 30 in those areas is of no special benefit. The tool 32 is the torque-measuring tool unit forming the subject matter of my copending application Ser. No. 781,396, filed Dec. 5, 1968, having a square drive shaft 33 on one end and a square socket 34 in the other end, for driving connection with any one of the square shanks 35 provided on the tools 31. A corresponding square shank 36 is provided on the other tool 37. In assembling the bars 24-27 in the case sections, the trunnion on one end of each bar is partially engaged in its sockets 29 and then the opposite wall of the case section is flexed outwardly enough to permit entering the other trunnion in the companion socket 29 provided in that wall, the bars being thereafter free to turn as required in the removal and replacement of tools that are mounted in the sockets 30. As seen in FIGS. 6 and 7, there are half-round ribs extending lengthwise of the sockets 30 at the middle of each of the four sides, molded integral with the bar,

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and, at the entrance to each socket, these ribs, which are rounded section, as seen in FIG. 6, for line contact with the four sides of the shanks 33, 35, and 36, are gradually reduced in height, as best seen in FIG. 7, to facilitate entry of the shank in the socket. The amount of give and resilience of the polyethylene used in these bars, plus the slickness of this material when in contact with steel, makes this form of tool holder and support ideal insofar as ease in removal and replacement of a tool is concerned, and yet the tools are held securely enough by reason of the resilience of the material when the ribs 38 are compressed and the surrounding walls of the sockets are spread to a slight extent also as the tool shank is pressed into place, making loosening and eventual dropping out of any tool practically impossible regardless of any anticipated rough handling of the tool carrier case.

It is believed the foregoing description conveys a good understanding of the objects and advantages of my invention. The appended claims have been drawn to cover all legitimate modifications and adaptations.

I claim:

1. In a tool case for elongated tools having shanks that are square in cross section with flat side faces, the case having spaced walls, an elongated bar of compressible and expansible resilient plastic material mounted at its opposed ends on said

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walls and having longitudinally spaced tool holder sockets provided therein of complementary square shape in cross section but slightly oversize relative to said shanks, each socket having friction ribs molded integrally with said bar extending longitudinally of flat faces therein adapted to be compressed and spread slightly by slipping the shank of a tool therebetween for detachably securing the tool in place on the bar, two opposed walls of each socket being also adapted to spread slightly upon insertion of a tool and serving to apply pressure resiliently to the tool shank through said ribs to retain the tool.

2. A tool case as set forth in claim 1 wherein said bar is molded of plastic material having characteristics similar to polypropylene.

3. A tool case as set forth in claim 1, wherein each of said ribs is rounded on its inner side for line contact with the flat face on the side of the square tool shank.

4. A tool case as set forth in claim 1, wherein each of said ribs is rounded on its inner side for line contact with the flat face on the side of the square tool shank, and each rib being furthermore of gradually diminishing thickness toward the mouth of the socket.

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