DEVICE FOR PICKING UP LITTER

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References Cited
UNITED STATES PATENTS
2,191,170 2/1940 Keehn et al. 294/110 A
2,804,356 8/1957 Thompson 294/50
2,864,196 12/1958 Rohan 294/61

ABSTRACT

A pick-up device including a tubular body and a shaft telescopingly received within the tubular body having a handle member on one end and a pick-up tool, such as a spike or gripping fingers, on the other end. A coil spring between the shaft and tubular body normally biases the shaft to a raised retracted position relative to the tubular body. Latch elements on the shaft and tubular body are adapted to automatically engage when the shaft has been forced through the tubular body, compressing the spring, to a protracted position. A manually actuated operating element within the shaft and handle member cooperates to release the latch elements upon actuation, causing the shaft to move to its retracted position.

7 Claims, 6 Drawing Figures
DEVICE FOR PICKING UP LITTER

BACKGROUND OF THE INVENTION

This invention relates to a pick-up device, and more particularly to a manually operated pick-up device for retrieving litter.

Pick-up devices including telescoping shaft members and manually actuated pick-up tools, such as tongs or gripping fingers and pointed rods or spikes, are known in the art. Examples of such devices are disclosed in the following U.S. patents:

3,105,715  Hopp  Oct. 1, 1963
3,183,031  Hafnerstink  May 11, 1965
3,446,525  Jones  May 27, 1969

Combination canes and extensible tools or retrievers are also known, as disclosed in the following U.S. patents:

889,035  Newsom  May 26, 1908
3,093,402  Sisson  June 11, 1963

However, none of the devices in any of these U.S. patents disclose a pick-up device in which the pick-up tool is latched against the action of a compressed spring in a retracted position. Moreover, these patents do not disclose a simple, manually actuated, release mechanism completely operable by one hand for unlatching the tool to automatically retract.

SUMMARY OF THE INVENTION

It is therefore an object of this invention to provide a pick-up device capable of operating different types of pick-up tools, and which is completely operable by one hand to protract and lock the tool under compression and to release the tool to a retracted position.

The pick-up device made in accordance with this invention includes an open-ended elongated tubular body telescopically receiving an elongated shaft having a handle member on one end and the pick-up tool on the opposite end. A coil spring operative between the shaft and the tubular body normally biases the shaft member to a raised position relative to the tubular body causing retraction of the pick-up tool. However, when the shaft member is forced down into the tubular body, the pick-up tool is latched in a protracted position, simultaneously compressing the coil spring.

This device further includes an operator element extending through the handle member and into the shaft cooperative with spring biased radial plungers. The radial plungers, when actuated, project radially to force outward the latch element fixed to the shaft to disengage the cooperating latch element on the tubular body, and thereby release the energy in the compressed coil spring to rapidly retract the pick-up tool.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a side elevation of one embodiment of the pick-up device made in accordance with this invention in protracted position;

FIG. 2 is an enlarged section, partially broken away, taken along the line 2—2 of FIG. 1;

FIG. 3 is a view similar to FIG. 2 showing the device in retracted position;

FIG. 4 is a much enlarged fragmentary section, illustrating the latch-releasing mechanism;

FIG. 5 is a fragmentary side elevation of a modified form of pick-up tool in protracted position; and

FIG. 6 is a view taken at right angles to FIG. 5, with portions of the tubular body broken away, illustrating the pick-up tool in retracted position in solid lines and protracted position in phantom.

DESCRIPTION OF THE PREFERRED EMBODIMENTS

Referring now to the drawings in more detail, FIGS. 1 - 4 disclose the pick-up device 10 made in accordance with this invention, incorporating the pointed impaling member or spike 11 as a pick-up tool.

The pick-up device 10 includes an elongated tubular body 12 having an open, flanged, lower end 13 and an open upper end 14.

Telescopingly received longitudinally and coaxially within the tubular body 12 is the shaft 16, terminating at its lower end in the spike 11. The upper portion 17 of the shaft 16 is of a reduced diameter to form the shoulder 18.

The upper end of the shaft portion 17 terminates in a handle member, such as the enlarged knob 20. Formed circumferentially within the tubular body 12 is an annular groove 22 which provides an abutment for the shoulder 18 in order to limit the upward movement of the shaft 16 relative to the tubular body 12. An O-ring 23 is placed between the lower wall of the groove 22 and the shoulder 18 as a shock absorber.

A coil spring 25 is coiled around the reduced shaft portion 17 and extends from the upper wall of the channel groove 22 to a spring retainer ring 26 fixed around the shaft portion 17. The size of the coil spring 25 and the distance between the annular channel 22 and the spring retainer 26 is such that the spring 25 biases the shaft 16 upward relative to the tubular body 12 until the shoulder 18 engages the O-ring 23. In this retracted position, the spike 11 is disposed entirely within the lower portion of the tubular body 12.

The lower portion of the knob 20 forms a boss 27 to which is fixed an elongated depending cylindrical skirt or collar 28 of a diameter slightly larger than the external diameter of the tubular body 12. The upper portion of the tubular body 12 is adapted to be telescopingly received within the skirt 28.

Struck out of the lower portion of the skirt 28 are diametrically opposed, longitudinal, resilient or elastic latch fingers 30 having lower hooked ends 31 pointing inwardly toward, and biased against, the tubular body 12. When the device 10 is in its protracted position compressing the coil spring 25, the hooked ends 31 engage the annular channel groove 22, as best disclosed in FIG. 2. It will be understood that the latch fingers 30 do not have to be struck out of the skirt 28, but may be formed separately and fixed to the skirt 28, so long as they perform the above-described latching function.

Mounted within a recess 33 in the top of the knob 20 is a manually actuable button 34 biased into a raised position by the coil spring 35 and provided with a depending operating rod 36 extending through a corresponding longitudinal hole 37 coaxially within the handle member 20 and the shaft portion 17. The lower end of the operator rod 36 terminates in a conical cam element 38.

Projecting in diametrical alignment from the rod hole 37 outwardly through the upper shaft portion 17 adjacent the conical element 38 are a pair of cartridges 39
containing springloaded latch release elements or stems 40. The inner ends 41 of the release stems 40 are adapted to be engaged by the downward protracting cam 38 in order to force the stems 40 radially outward through corresponding longitudinal slots 43 in the wall of the tubular body 12 and into engagement with the latch fingers 30. The range of the stems 40, when radially protracted, is great enough to force outward the resilient latch fingers 30 until their hooked ends 31 have disengaged the annular channel groove 22, thereby permitting the stored energy within the coil spring 25 to force the shaft 16 and the pointed pick-up tool 11 upward to their retracted position.

Each of the stems 40 is normally urged or biased to its inner retracted position by means of the coil spring 44 within the cartridges 39 and biased against the retainer flange 45 fixed to each stem 40. Thus, when the operator rod 36 is biased upward to its inactive position by the button spring 35, then the release stems 40 will also be retracted inward to disengage the respective latch springs 30 causing the hooked ends 31 to be biased by the inherent resilience of the material in the fingers 30 toward and against the tubular body 12.

As best disclosed in FIGS. 5 and 6, the pick-up device 50 may be modified as disclosed, to operate a pick-up tool 51 including a pair of looped gripping fingers 52, for grabbing and releasing objects, such as bottles, cans, etc.

The pick-up device 50 includes all of the elements of the device 10, including the shaft 16' and optionally the pointed tool or end 11' telescopically received within the tubular body 12'. However, the lower portion of the tubular body 12' is provided with diametrically opposed longitudinal slots 53. Projecting radially through the slots 53 are a pair of ears 54 fixed to the shaft 16'. Pivotedly connected to the ears 54 by means of pins 55 are link arms 56, the opposite ends of which are pivotally connected by pins 57 to another set of link arms 58. The other ends of the link arms 58 are pivotally connected by pins 59 to ears 60 fixed to the lower end of the tubular body 12'. Thus, the link arms 56 and 58 form a toggle connection having a knee joint at the journal axis 57. Fixed to the link arms 58 adjacent the journal pins 57 are the upper ends of the gripping fingers 52.

Thus, when the shaft 16' is in its protracted position, as disclosed in FIG. 5, and in phantom in FIG. 6, the gripping fingers 52 are in their closed position for gripping an object. Upon pushing of the button 34 to release the latch fingers 30, and thereby retract the shaft 12', the toggles 56 and 58 are extended or flattened, as disclosed in solid lines in FIG. 6, to immediately open or separate the gripping fingers 52 in order to release the object.

In the operation of the pick-up device 10, initially, the device is in its retracted position as disclosed in FIG. 3. The operator grasps the knob 20 and places the open bottom end 13 of the tubular body 12 upon the ground over the piece of litter or scrap paper. He then forces the handle 20 down, thereby moving the shaft 16 down, compressing the spring 25 and forcing the pointed spike 11 down through the paper and into the ground. When the shaft 16 reaches the position disclosed in FIG. 2, the spring fingers 30 biased against the tubular body 12 latch the tubular body as the hooked ends 31 register with the annular channel recess 22, as disclosed in FIG. 2. The coil spring 25 as well as the tubular body 12 and the shaft 16 are then latched in the protracted position. By grasping the skirt 28 or knob 20, the entire device 10 is lifted from the ground with the paper impaled upon the spike 11. The device is carried to a waste receptacle where the pointed end 11 is placed over the receptacle. The operator then depresses the button 34 to release the latch arms 30 causing the shaft 16 to retract, or rather causing the tubular body 12 to protract or move downwardly relative to the shaft 16 to force the paper off of the spike 11 into the waste receptacle. The device 10 is then in position and ready for the next pick-up operation.

It will be noted that the entire operation of impaling the litter paper and extracting it from the spike 11 is carried out entirely by one hand of the operator.

Moreover, the stored energy of the coil spring 25 is utilized to extract the paper from the spike 11, or in other words to retract the spike 11 within the tubular body 12, rather than to protract the spike 11. The reason for this is that it is easier for the operator to push the knob 20 down and thereby force the spike 11 into the paper or the ground, than it is to perform the reverse operation. Accordingly, the stored energy of the coil spring is utilized to perform the more difficult task.

What is claimed is:
1. A pick-up device comprising:
   a. an elongated tubular body having open upper and lower ends,
   b. an elongated shaft telescopically received longitudinally within said body,
   c. said shaft having an upper end portion terminating in a handle member, and a lower end portion terminating in a pick-up tool,
   d. compressible spring means cooperative between said shaft and said tubular body to bias said tubular body downward relative to said shaft to place said pick-up tool in a normal retracted position,
   e. said spring means being adapted to be compressed by the movement of said shaft downward relative to said tubular body to place said pick-up tool in a protracted position,
   f. a first latch element attached to and movable with said shaft, said first latch element depending exteriorly along said tubular body,
   g. a second latch element fixed to the exterior of said tubular body for engagement by said first latch element to hold said pick-up tool in said protracted position,
   h. a manually actuated operator element on said handle member,
   i. operative means connected to said operator element and cooperative with said first latch element to force said first latch element away from said second latch element when said operator element is actuated, permitting said tubular body to move downwardly relative to said shaft.
2. The invention according to claim 1 in which said operator element comprises an elongated operator rod extending longitudinally from said handle member through said shaft, said operative means comprising a release element within said shaft and cooperative with said operator rod for lateral movement through said tubular body for engagement with said first latch element.
3. The invention according to claim 2 in which said release element comprises a spring-loaded plunger projecting radially through said shaft and said tubular
body, said operator rod being adapted to force said plunger radially outward when actuated.

4. The invention according to claim 3 in which said operator rod has its upper end portion terminating in a spring-loaded, manually depressible, button in said handle member.

5. The invention according to claim 4 further comprising a longitudinal slot in said tubular body receiving said spring-loaded plunger for guiding said shaft and tubular body in a non-rotatable telescoping relationship.

6. The invention according to claim 1 in which said first latch element comprises an elongated elastic finger having a lower hooked end projecting toward said tubular body, said second latch element comprising a groove formed in the exterior of said tubular body for receiving the hooked end of said first latch finger.

7. The invention according to claim 1 in which said pick-up tool comprises a pointed impaling element, said pointed impaling element being adapted to be sheathed within said tubular body above said open lower end in said retracted position, and adapted to depend below the lower end of said tubular body in protracted position.

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