March 23, 1965 I. R. KOLMAN 3,174,787

ADJUSTABLE TENSION STRAPS

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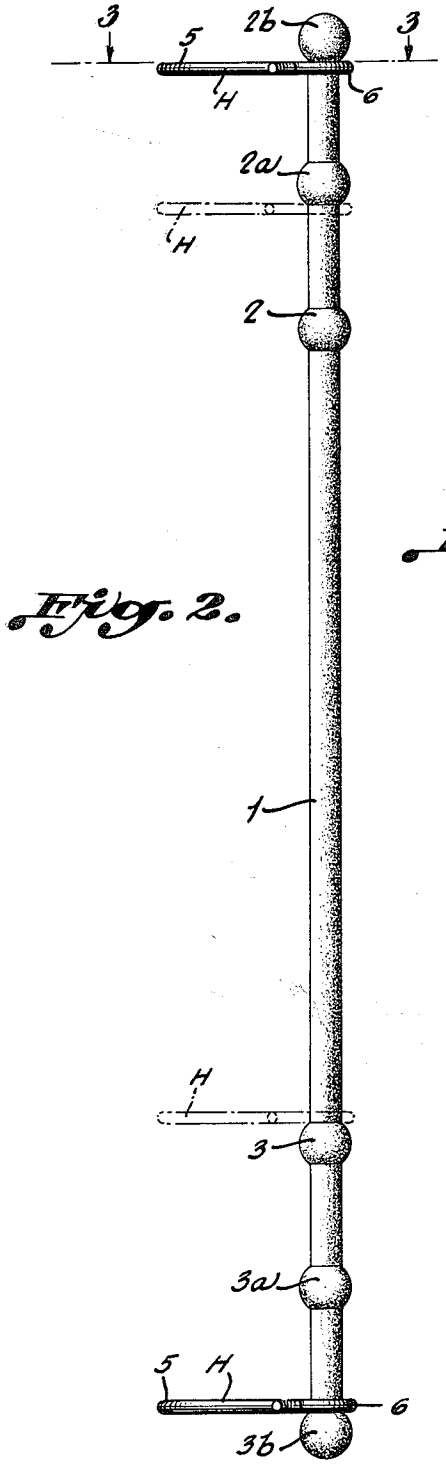


Fig. 2.

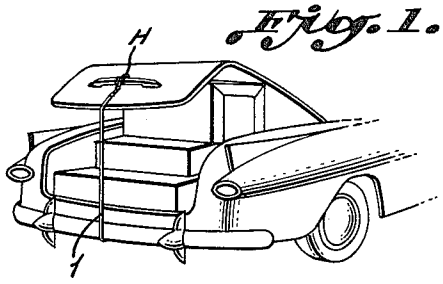


Fig. 1.

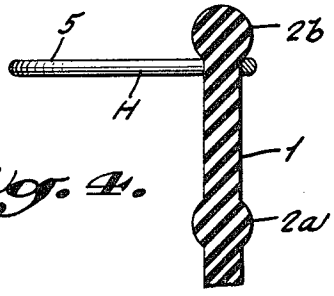


Fig. 4.

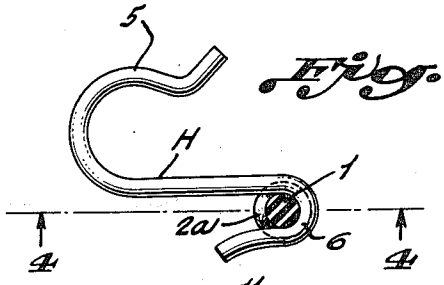


Fig. 3.

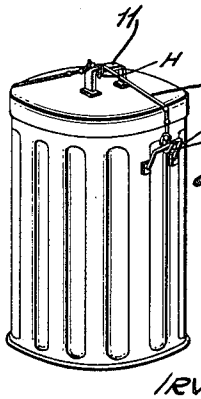


Fig. 5.

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ADJUSTABLE TENSION STRAPS

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This invention relates to an adjustable tension strap, and more particularly to a flexible fastening strap of resilient material provided with terminal hooks which are capable of engagement in many diversified locales to afford a universally adaptable fastening and hold-down strap.

It is the object of the present invention to provide a flexible fastening strap formed of resilient material, such as rubber, plastic or the like, to which may be detachably affixed fastening hooks, at selective points thereof, for the purpose of providing an adjustable tension strap having multiple uses.

It is a further object of the invention to provide a molded strap of flexible material, of low cost and simple construction, which is capable of adaptation to many different lengths between the terminal hooks which are associated with the strap, in order to adapt the unit for uses having a wide range of required lengths.

It is another object of the invention to provide a tension strap which will not scratch or damage the surfaces of articles to which the same may be applied, and one which will provide a positive tension for multiple spans, by virtue of the simple adjustability thereof.

The invention proceeds upon the principle of providing a molded strap of resilient material, of limited length, which is expansible and contractible without permanent deformation, and which is provided with a plurality of enlargements or protuberances adjacent the opposite ends thereof which serve as stops for the constricted terminals of fastening hooks, the free ends of which are adapted to engage suitable holes, handles, brackets, flanges and the like, to yieldingly serve as an adjustable tension strap between such elements.

Other objects and purposes will appear from the detailed description of the invention following hereinafter, taken in conjunction with the accompanying drawing, wherein

FIG. 1 is a perspective view showing the application of the tension strap in accordance with the invention between the rear bumper and the door of the luggage compartment of a vehicle;

FIG. 2 is a front elevation of the tension strap in accordance with the invention, including the fastening hooks associated therewith, with the capabilities of adjustment of the tension strap being indicated by alternative displacements of the fastening hooks, shown in dotted lines;

FIG. 3 is a horizontal sectional view along line 3—3 of FIG. 1;

FIG. 4 is a vertical sectional view along line 4—4 of FIG. 3; and

FIG. 5 is a perspective view showing the application of the tension strap for retaining a container lid in place.

In the drawing is shown a flexible tension strap 1 which may be molded of any suitable flexible material such as rubber, plastic or composite materials, and which may be fabricated in many different sizes in dependence upon the purposes to be served thereby. A highly practical size for household needs is one of approximately 15" in length and ¼" in diameter.

A plurality of enlargements 2, 2*a* and 2*b* are molded integrally adjacent to one end thereof, and a similar group of enlargements 3, 3*a* and 3*b* may be molded integrally thereof adjacent the opposite end thereof. These enlargements may assume the form of spherically-shaped protuberances having a diameter substantially double that of

the rod 1, so that if the cylindrical core of the strap is ¼" in diameter, the protuberances may be of the order of ½" in diameter. They may be displaced at 1½" centers so that the effective length of the strap, in the example above, may be varied of approximately 15" to 9" in six equal increments.

A fastening hook H is provided with one terminal 5 to form a large eye for engagement with any desired holding element such as a handle, aperture, bracket, bumper, flange and the like. The opposite terminal 6 is formed to provide a gap of smaller size and one which is critically dimensioned corresponding to the diameter of the core 1. As shown in FIGS. 3 and 4, the gap of the terminal hook 6 is sufficiently large to embrace or straddle the core 1, but the same is blocked by any one of the enlargements molded integrally with the strap. The terminal hook 6 is readily detachable from the core 1 at the gap thereof by a transverse translating movement of the hook relative to the core. The gap at the hook 6 is exterior to the internal engaging portion of the hook terminal 5. Thus, the placement of the hook adjacent any one of the enlargements inwardly of the ends thereof provides a selective length of tension strap which may be varied to afford any desired degree of tension depending upon the distance to be spanned by the strap and the tension stresses desired to be imposed thereon. For example, as shown in FIG. 1, one hook may engage the handle of the luggage door of an automobile while the other hook may engage the lower edge of the rear bumper, in order to make certain that the door will be forced in the direction of a closed position without possibility of loss of the contents from the luggage compartment.

In FIG. 5 is illustrated another locale of use of the tension strap in which one of the hooks H is engaged with the handle of a trash container, while the other hook is engaged with the handle of the cover after the tension strap is looped through the opposite handle of the trash container. Conceivably, one hook of the tension strap may engage the handle 10 of the container and then may be looped around the handle 11 of the lid with the opposite hook engaging the opposite handle 10 of the container.

As indicated in FIG. 2, the selective placement of the hooks adjacent to each one of the multiple enlargements at each end of the flexible strap affords six adjustments in length, so that the device may be adaptable to many uses. In addition to those illustrated in the drawing, the straps may be used effectively as retaining straps for luggage racks at the roof of a vehicle, as tension straps for tire chains, as holders for boat covers, tarpaulin hold-downs and the like.

Since the engaging hooks for the strap are connected at the effective terminals thereof, the operative spanning portion of the strap does not mar any surfaces in contact therewith, by virtue of the soft and non-abrasive character of the main body of the tension strap.

It is understood that the number, shape, spacing, symmetry and distribution of the protuberances on the tension strap may be varied as desired and in dependance upon special needs.

While I have described my invention as embodied in a specific form and as operating in a specific manner for purposes of illustration, it should be understood that I do not limit my invention thereto, since various modifications will suggest themselves to those skilled in the art without departing from the spirit of my invention, the scope of which is set forth in the annexed claims.

I claim:

1. A device of the class described, comprising a flexible fastening strap of resilient material of predetermined cross-section, a plurality of integrally molded enlargements adjacent to at least one end of said strap, and a readily de-

tachable fastening hook engaging said strap with the external part of the hook and adjacent to one of said enlargements inwardly of the end thereof, said fastening hook being of S-shaped configuration with one terminal thereof presenting a gap of sufficient spacing to straddle said strap adjacent to said one enlargement while said enlargement presents a stop therefor.

2. A device of the class described, comprising a flexible fastening strap of resilient material of substantially cylindrical cross-section, a plurality of integrally molded enlargements adjacent to the opposite ends of said strap, and a readily detachable fastening hook engaging said strap with the external part of the hook and adjacent to one enlargement inwardly of each end thereof, said fastening hook being of S-shaped configuration with one terminal thereof presenting a gap of sufficient spacing to straddle said strap adjacent to said last-mentioned one of said enlargements while said enlargement presents a stop therefor.

3. A device of the class described, comprising a flexible fastening strap of resilient material of substantially cylindrical cross-section, a plurality of spaced integrally molded

substantially spherical protuberances adjacent to the opposite ends of said strap, and a readily detachable fastening hook engaging said strap with the external part of the hook and adjacent to one enlargement inwardly of each end thereof, said hooks being of S-shaped configuration with one terminal thereof presenting a gap of sufficient spacing to straddle said strap adjacent to one of said spherical protuberances which forms a stop against the outward movement of said hooks towards the ends of said strap.

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