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S. J. CHRIS

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CLAMPING STRUCTURE

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Fig. 1

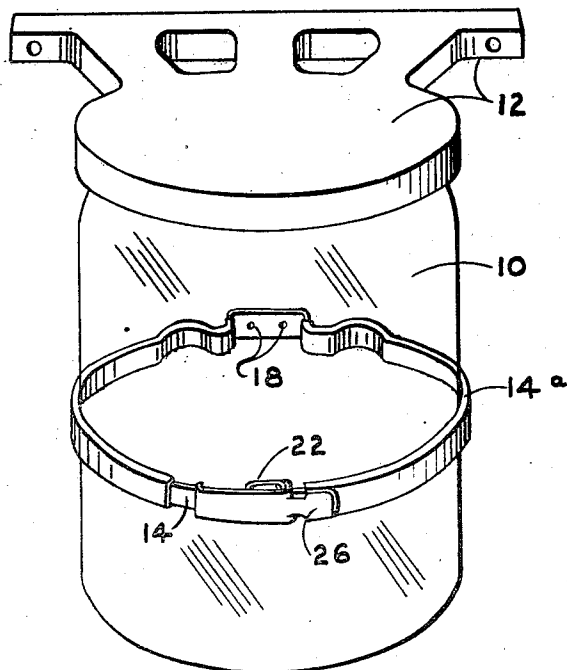


Fig. 2

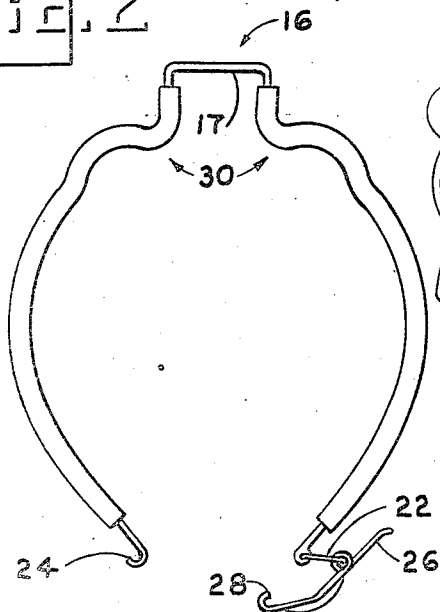
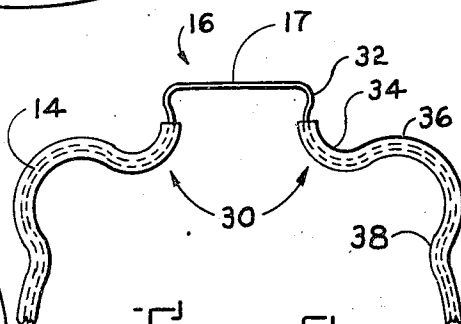


Fig. 3



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CLAMPING STRUCTURE

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3 Claims. (Cl. 248—316)

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This invention relates to holding or clamping means and has for its object to provide such devices with a degree of resilience that will ensure that the part secured by the device is firmly held, notwithstanding minor variations in the size of the part or the subjection of the part to severe vibration.

The invention is particularly designed to be incorporated in a readily detachable clamp so formed as to exert a firm grip on the part held without the use of springs or other additional parts.

An object of the invention is to provide a one-piece clamp element so formed as to provide a desired degree of resiliency by the special configuration of the element.

A further object of the invention is to provide a resilient clamping element which is inexpensive to manufacture yet efficient and durable in service.

Further objects and features of the invention may hereinafter appear in the following description and accompanying drawing in which a preferred form of the invention is shown by way of illustrative example only. It is to be understood that the scope of the invention is not limited by this illustrative showing but only as defined by the appended claims.

In the drawing, in which identical numerals indicate identical parts in different views,

Figure 1 is a perspective view showing the clamp in use.

Figure 2 is a plan view of the clamp.

Figure 3 is a fragmentary plan view of the clamp to an enlarged scale.

Referring now to the drawing, the invention is shown as a quick detachable clamp for a jar 10 containing liquid. The jar is shown as screwed into a combined closure and bracket 12 preferably made of plastic or other relatively frangible material which is screwed to a wall or partition in an airplane. The jar is held securely clamped against the wall by a strap 14 of spring steel to prevent vibration loosening the jar in the bracket, or possibly causing fracture of the bracket. The strap 14 is formed to provide an offset attaching portion 16 of generally U shape secured to the partition by screws 18, the strap 14 being furnished at its free ends with a readily releasable toggle and lever catch acting to both impart hoop tension to the strap 14 and to secure the free ends of the band together. This catch may be of usual form comprising a swinging toggle link 22 pivotally connected to one end of the strap 14, a lever being pivotally mounted on the link

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and having a thumb piece 26 and a catch portion 28 adapted to engage over the rolled back end 24 of the other end of the strap.

In the form of the invention illustrated in the drawing, the strap is formed with a bent portion 30 at each side of the offset portion 16. The bent portion is preferably formed so as to be clear of the surface on which the holding device is supported so as to be free to yield without constraint.

As shown in the drawing the contour of the bent portion 30 is generally of S shape. The closing of the toggle catch member will exert a pull on the strap which will effect a slight straightening of the S bend. The grip of the holding device is therefore secure although the device possesses sufficient resiliency to accommodate itself to minor differences in size of the part held or of the various portions of which the holding device is composed.

As shown in detail in Figure 3 the bent portion 30 of the strap or band comprises a plurality of curved portions the general purpose of which is to enable the holding device to accommodate itself to articles of somewhat varying sizes engaged in a bracket cooperating with the holding device while enabling the relation of the bracket and article to remain unchanged, thus avoiding the imposition of stresses on the bracket.

The straight portion 17 of the U-shaped securing portion 16 is connected to the side portions by a curved section 32 merging through a reverse curve 34 with the peripheral contour of the device, as seen in plan. The curve 34 merges with an outwardly bowed curve 36, which is intended to afford a desired degree of yield under the hoop tension in the band 14 set up by the lever clamp securing the ends of the band 14 together around the article held. The curve 36 is preferably connected by a further curve 38 with the flat portion of band 14. The provision of a continuous series of curves ensures that concentration of stresses is avoided. The curved portion 32 facilitates the opening apart or closing together of the sides of the U-shaped member and thus enables the holding device in closed position to assume a larger or smaller diameter while leaving the center point of the space enclosed unmoved and therefore the relation of the bracket 12 and holding device remains undisturbed.

A covering of rubber or plastic is preferably applied to the strap 14 as indicated at 14a to avoid possible marring of the surface of the part held in the clamp.

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It will be obvious that the bent portion 30 may be given configuration of various forms. For instance, the bent portion might be formed as a corrugated length of the strip.

Articles of other than cylindrical form can be held by providing a resilient portion at spaced points in the length of strip in order to ensure resiliency. Additional adjustability can be obtained by forming the strap in two portions overlapping at the offset portion 16, holes for screws being provided in each portion so that the offsets can be overlapped to different amounts.

Any suitable clamping device can be used for securing the ends of the strap around the article to be held provided the device exerts a pull on the strap or band from which the clamp is made.

The device is one of wide applicability for use where articles are required to be securely but releasably held, particularly where vibration or jarring is to be expected as in airplanes or railway trains. An example of such articles are hand fire extinguishers and thermos jugs. It is therefore to be understood that the clamp of this invention may be modified in various ways by those skilled in the art without departing from the scope of the invention as defined by the appended claims.

I claim:

1. A securing device, comprising: a flexible band of inextensible material bent substantially to a hoop shape; means carried by the opposite ends of said band cooperative with each other for drawing and securing the same together to impart a hoop compression to an article circumscribed by the band, the medial portion of the band being formed with a plurality of oppositely directed U-shaped portions, the bow of at least one of said portions being substantially flat and adapted to be clamped in facewise engagement against a flat supporting surface, the band between said U-shaped portions and the ends thereof being smoothly curved and free of any transverse deformation, the material of said band being sufficiently flexible to permit said U-shaped portions to be elongated when the ends of the bands are drawn together whereby the effective diameter of said device can be increased so that articles of varying diameters can be circumscribed and securely clamped by the device.

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2. A securing device, comprising: a flexible band of inextensible material bent to a substantially hooped shape; means carried by the opposite ends of said band cooperating with each other for drawing and securing the same together to impart a hoop compression to an article circumscribed by the band, the medial portion of the band being formed with an outwardly extending substantially U-shaped portion, the bow of which is relatively flat and adapted to be clamped in facewise engagement with a substantially flat supporting surface, the portions of the band on opposite sides of said U-shaped portion being provided with sigmoidal deformations, the band between said sigmoidal deformations and the ends thereof being smoothly curved and free of any transverse deformation, the material of said band being sufficiently flexible to permit said sigmoidal deformations to be elongated when the ends of the band are drawn together whereby said device can be used to circumscribe and securely clamp articles of varying diameters.

3. A securing device, comprising: a flexible band of inextensible material bent substantially to a hoop shape; means carried by the opposite ends of said band cooperative with each other for drawing and securing the same together to impart a hoop compression to an article circumscribed by the band, the medial portion of the band being formed with a plurality of oppositely directed U-shaped portions, the bow of at least one of said portions being substantially flat and adapted to be clamped in facewise engagement against a flat supporting surface, the band between said U-shaped portions and the ends thereof being smoothly curved and free of any transverse deformation, the material of said band being sufficiently flexible to permit said U-shaped portions to be elongated when the ends of the bands are drawn together whereby the effective diameter of said device can be increased so that articles of varying diameters can be circumscribed and securely clamped by the device; and a sheath of resilient material covering the smoothly curved opposite end portions of said band.

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