

- [54] **HANGER DEVICE**
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- [51] Int. Cl.A47f 5/01, A47f 7/00
- [58] Field of Search.....211/181, 59, 112, 119, 118, 211/113, 57, 175; 248/302-303, 214-215, 231; 24/123.5, 131 C, 129 C; 118/502, 500, 503

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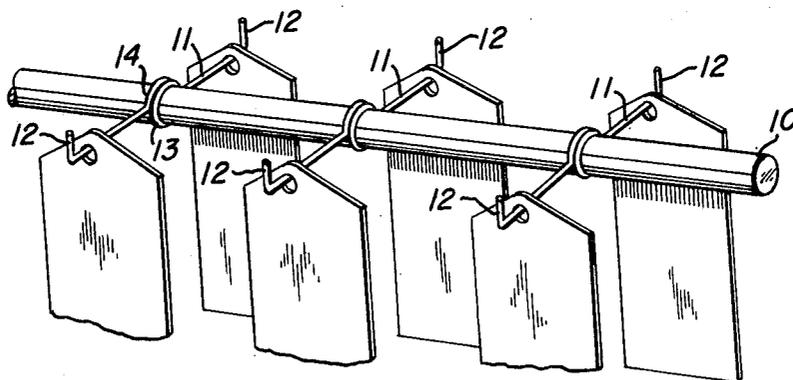
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[57] **ABSTRACT**

Apparatus for use in fabricating paint racks or like structures featuring a unique prestressed hanger device having an inherent capability to firmly grip a support on slip fit thereto. The hanger device of the invention is so constructed to obviate the need for special fastening or bonding means on application of the device to its base support. On suspension of articles therefrom it is inherently endowed with a supplemental and strengthened gripping action.

8 Claims, 6 Drawing Figures



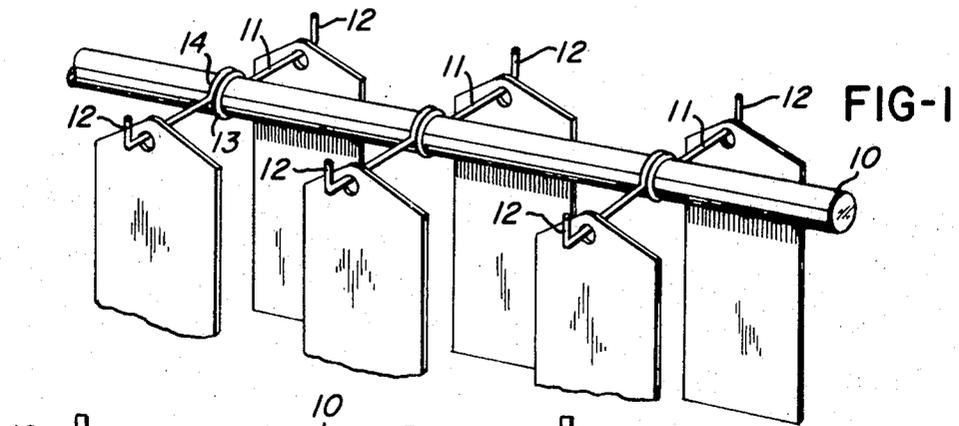


FIG-1

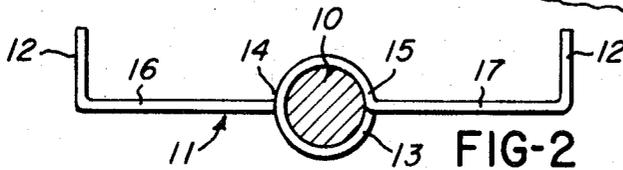


FIG-2

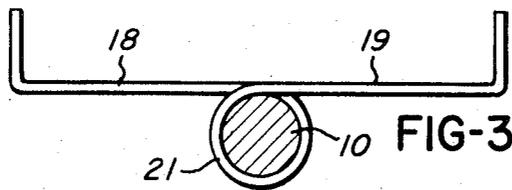


FIG-3

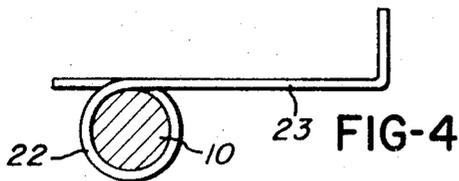


FIG-4

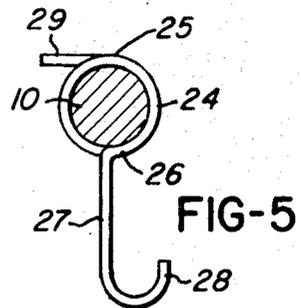


FIG-5

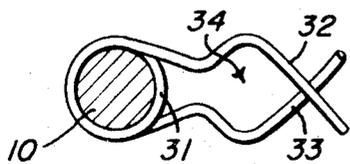


FIG-6

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HANGER DEVICE

BACKGROUND

This invention relates to hanger devices having particular advantage for use in creating paint racks and like plural support structures. It more particularly provides an improved and simplified clip-type suspension means facilitating the ready assembly, disassembly, and maintenance of such structures.

At one stage or another in the manufacture of most products it has been a common procedure to use racks to suspend their component parts in a manner to expose their surface portions for washing, paint spraying, drying, and like operations. The conventional rack employed for such purposes will normally include a base structure mounting hanger support portions which have fixed thereto various projecting hanger devices, from which devices are suspended the parts to be washed, sprayed, or the like.

The hanger devices are conventionally made of spring steel for strength and durability. In the prior art it has been the practice to weld, braze or otherwise metallurgically bond these devices to their base support. This has created many problems since the heat required to fuse or join the devices to their base support causes the hangers and in some instance the material of their support to crystallize at and adjacent to the point of fusion. As will be obvious, this weakens the hanger support. As a result, the hangers have a tendency to break away from their main support under load. In some instances the hanger devices have been attached by separate fastening means. This has in most cases been objectionable since this creates an added element of cost and basic disadvantages in fabrication and assembly of the hanger devices.

SUMMARY OF THE INVENTION

The present invention provides hanger clips of an inexpensive form which may be more readily mounted to a base support, for example in a paint rack or like structure. Their configuration and physical character is such they may be used in a manner to substantially preclude their breakage under normal usage. The problems incident to using a fused joint to attach a hanger device is avoided by providing the invention clip with an integrated self-acting gripping portion which may be releasably interfit with its base support so as to preclude displacement. The invention clip is endowed with an inherent property of tightening to its base support under the influence of a suspended load.

It is a primary object of the invention to provide an improved suspension device having special advantage in application to paint racks, wash racks and like structures.

Another object of the invention is to provide an improved suspension or hanger clip which is economical to fabricate, more efficient and satisfactory in use and adaptable to a wide variety of applications.

A further object of the invention is to provide a new hanger clip comprising in its own configuration a means of attachment to a base support which obviates the need for use of separate fasteners or fusion bonding techniques, such as commonly employed for similar purposes.

An additional object of the invention is to provide simple means for incorporating in paint racks and like plural support structures hanger devices which preclude the incidence of hanger breakage.

Another object of the invention is to obviate the need for special interconnections or interconnecting devices between suspension-type hangers and their base support.

A further object of the invention is to provide a hanger clip, and improved plural support structures such as paint racks utilizing the same, possessing the advantageous structural features, the inherent meritorious characteristics and the means and mode of use herein described.

With the above and other incidental objects in view as will more fully appear in the specification, the invention intended to be protected by Letters Patent consists of the features of construction, the parts and combinations thereof, and the

mode of operation as hereinafter described or illustrated in the accompanying drawings, or their equivalents.

Referring to the accompanying drawings wherein are shown some but not necessarily the only forms of embodiment of the invention,

FIG. 1 is a perspective view of a fragment of a paint rack including a horizontally disposed support of rod or tube form having attached thereto hanger clips in accordance with one embodiment of the invention;

FIG. 2 is a cross-sectional elevation view showing greater detail of the hanger clip of FIG. 1; and

FIGS. 3 through 6 each provide a view similar to that of FIG. 2 showing various forms of hanger clip devices which may be contrived utilizing the principle of the present invention.

Like parts are indicated by similar characters of reference throughout the several views.

While the invention clip is here described with particular reference to a preferred embodiment in paint racks or like structures, this is merely for purposes of illustration. It will be self-evident from the following that the area of its application is unlimited.

We are here concerned with the specific characteristics of the invention clips and their coaction with their primary support structure. Therefore, in FIGS. 1 and 2 of the drawings the detail of disclosure is limited to the clips 11 as they mount in longitudinally spaced relation on a horizontally disposing rod 10.

The rod 10 may appear in a paint rack or like structure in single or plural form. Its base support structure may be of any suitable nature and mounts to a fixed or moving surface, such as that provided by a conveyor, which is disposed in or moves through a chamber wherein the suspended parts may be processed. In any event, the detail of the base support is within the capabilities of a mechanic versed in his art and is not essential to an understanding of the present invention. Therefore, such details are not further described.

As particularly seen in FIG. 2, the clip 11 according to the invention, there shown, is made of spring steel wire stock and formed intermediate its ends with a loop 13. In a preferred method of making the clip, the wire stock is formed about an arbor and subsequently heat-treated to endow it with the required strength and resiliency. With respect to the particular embodiment of FIG. 2, in forming thereof the wire is turned about the arbor one and one-half times so that loop 13 is provided with arcuate portions 14 and 15 which extend approximately 180° and overlap. At remote extremities of the portions 14 and 15, which define a diameter of the loop 13, the respective ends of the wire stock are bent to project oppositely and to form thereby laterally projected suspension arms 16 and 17. These arms are of substantially equal length and, as seen in FIG. 2, they respectively terminate in vertically projected hook portions 12 which are generally parallel.

The arbor about which the wire stock is wound will have a diameter equal to or slightly less than that of the support rod to which the clip will mount. Therefore, in assembly to a rod or tube, by a pressured slip fit in an obvious manner, in this process the loop 13 is expanded. On release thereof in place, the loop will seek its original diameter and will inherently exert a friction grip which is substantially uniform about its rod support. The clip will fix itself in place yet accommodate a simple manipulation of its ends facilitating its slip removal.

Thus, in application of a clip 11 to a rod 10 its central integrally formed loop 13 firmly grips its base support while in a medial transverse plane thereof there projects to either side of the rod a horizontally disposing suspension arm 16 or 17 having a hook extremity 12. The latter, in an obvious manner, provides suspension means for parts to be hung therefrom for suitable processing, such as painting, washing, etc., as a situation may require. When an article is suspended from a suspension arm the dependent load will influence an inherent wrapping force reflected in the loop 13. This causes an even tighter grip of the rod 10 which precludes inadvertent slippage or displacement during the processing procedure.

Accordingly, we here provide a hanger clip of spring steel wire preformed with a loop in the body thereof, which loop slip fits and fixes to its base support in a manner to obviate the need for fusion, with its attendant material deteriorating influence, or fasteners, which render more difficult and more expensive its application. That load increases the suspension capabilities of the invention clip, without undue stress, is self-evident and extremely advantageous. That the invention clip is nevertheless readily removable in a manner to facilitate its replacement is also obvious. This enables a paint rack, for example, to be quickly adapted for different applications by a ready and economical exchange of the clip suspension device.

In use of the invention devices one also avoids hanger damage due to inadvertent impact forces, since the clip form inherently adapts it to accommodate applied stress to dissipate throughout its loop-mounting portion.

While in the drawings the loop is preferably shown as circular, it may obviously, in some instances, be noncircular. Thus the expression "loop" comprehends a noncircular configuration which is similarly formed to inherently compress and fix in place on application of the clip in which it is embodied to a base support.

As should also be obvious, the invention clip will accommodate a greater load and with more effectiveness than a conventionally fixed hanger device directed to similar purposes.

The hanger clip shown in FIG. 3 is to some extent like that of FIG. 2. The wire stock is there shown to provide arms 18 and 19 which extend oppositely from an intermediately formed loop 21. In this instance, however, there is only a single turn of the wire stock, the further arcuate bending of the wire stock to form portions such as 14 and 15 of FIG. 2 being omitted. Therefore, the arms 18 and 19 project oppositely from and tangentially to the periphery of the loop 21 rather than from a midportion thereof. While this embodiment is not preferred, for some applications the form thereof will be adequate.

The clip form shown in FIG. 4 is contrived by the wire stock being formed to provide adjacent one end a single loop 22 similar to the loop 21 of FIG. 3. The one end of the wire is a short projection while the other end defines an elongated suspension arm 23 terminating in an upwardly inclined hook portion. As seen in the drawings, the short projection and the arm 23 are directed oppositely and in a plane generally tangential to the upper portion of the loop 22. As will be readily seen, on slip fit of the loop 22 to a rod and suspension of a load from the arm 23, there is inherently produced a self-wrapping action on the loop 22 which fixes it more tightly to its base support.

The clip form of FIG. 5 is a modification of that shown in FIG. 4. It includes a loop portion 24 which is formed by turning wire stock one and one-half times on itself adjacent one end. The added one-half turn creates arcuate portions 25 and 26 which overlap, the ends of the overlapped portions terminating in a medial transverse plane of the formed loop. One elongated extremity of the formed wire stock is bent to project radially of the formed loop as an arm 27 terminating in a hook 28. The other extremity of the wire is short and extends tangentially of the loop periphery, at right angles to the arm 27. The arrangement, as indicated in FIG. 5, is one to provide for the hanger clip to mount with its elongated arm in a vertically dependent relation to its base support rather than in a laterally projecting relation thereto as in the case of the clip forms of FIGS. 2, 3, and 4. It will be recognized that a feature of the invention, however, is, in this case as in all others, that the hanger clips may be initially adjusted to any desired angular position upon the base support and may be readjusted at will to a different angular position by a simple pressure application to overcome the tight grip of the looped portion of the clip on its support.

FIG. 6 shows yet a further modification. Here a spring wire clip has been formed to define an intermediate loop 31. The loop 31 is provided by slightly more than one and one-half turns of the wire on itself, the respective ends being provided to project first generally parallel, then inwardly to each other,

to be followed by divergent convergently formed portions the ends of which cross in an overlapping relation. Thus, extremities of the wire extend peripherally of the formed loop in a common direction. They divert to form therebetween a substantially diamond-shaped recess 34 and then cross to close this recess. The clip form here shown is to more protectively encompass a portion of an article suspended therefrom during a working thereon. As will be seen, the arms 32 and 33 are symmetrical so that no right or wrong way of attachment of the clip to its support exists. Either arm has a bent portion forming a depression which will accommodate its engagement under a portion of an article. In any case, the thrust applied to the arm in question by the weight of a suspended article will be accommodated in the loop 31 to cause it to more tightly engage to its base support.

From the foregoing it should be self-evident that the present invention provides a device enabling the simple fabrication of plural support structures which may be readily adapted to meet the required need by a simple interchange of its clip forms.

From the above description it will be apparent that there is thus provided a device of the character described possessing the particular features of advantage before enumerated as desirable, but which obviously is susceptible of modification in its form, proportions, detail construction and arrangement of parts without departing from the principle involved or sacrificing any of its advantages.

While in order to comply with the statute the invention has been described in language more or less specific as to structural features, it is to be understood that the invention is not limited to the specific features shown, but that the means and construction herein disclosed comprise but one of several modes of putting the invention into effect, and the invention is therefore claimed in any of its forms or modifications within the legitimate and valid scope of the appended claims.

Having thus described my invention, I claim:

1. Suspension apparatus comprising a rack or like support structure including in mounted relation thereto at least one substantially horizontally extending rodlike support element, at least one spring wire hanger element mounted on said rodlike element, said hanger element including an integrally formed coiled portion having a pressured slip fit upon said rodlike support element obviating slipping and deforming of said hanger element in the presence of a suspended weighted article without need for bonding between said rodlike support element and said hanger element, said hanger element further including end portions defining a pair of arms projecting substantially horizontally and in opposite directions from said rodlike support element in positions relative to said coiled portion that each of said arms under gravity loading by a weighted article suspended substantially perpendicular to the support element acts as a lever to tighten the coiled portion of said hanger element into a more secure gripping engagement with said support element, and each of said arms including retention means for a suspended article.

2. Suspension apparatus as in claim 1 characterized in that at least one of said projected end portions of said hanger element has a form and position providing it will project tangentially of and substantially horizontally from the uppermost limit of said coiled portion.

3. Suspension apparatus as in claim 1 characterized in that said hanger element has ends which project oppositely of one another and commonly disposed in a horizontal plane transverse to an uppermost portion of said coiled portion.

4. Suspension apparatus as in claim 1 characterized by said end portions projecting oppositely, approximately 180° apart and each forming a lever on either of which a suspended article will induce a self-locking action of the hanger element to said support element.

5. Suspension apparatus according to claim 1 characterized by end portions of said hanger element projecting in a sense generally radial to said coiled portion and said end portions forming remote levers a directly dependent load on either of

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which will induce a self-locking action of the hanger element to said support element.

6. Suspension apparatus as in claim 1 characterized in that said coiled portion forms a loop of at least 360° in extent and said end portions projecting in different directions to form hooklike suspension devices the loading of which will induce a self-lock of said hanger element to said support element.

7. Suspension apparatus as in claim 1 characterized in that at least one of said projected end portions extends laterally

and immediately of said coiled portion to provide a generally horizontal segment and upwardly facing means for retention of a suspended weight.

8. Suspension apparatus as in claim 1 characterized by said hanger element including extensions of said coiled portion terminating in said end portions which have a hook form, the suspension of the weight on either of which will produce a self-locking action of the hanger element to said support.

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