LOCKING WALL HANGER

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ABSTRACT

The invention provides a locking wall hanger having a pointed end, which is designed to create the hole in the wall as the hanger is inserted therethrough. Whereas a self-boring tip penetrates the wall and embeds itself in the rear wall surface a mid-parabolic portion of the hanger is adjusted to provide a spring force for locking the hanger to the wall. In order to provide a maximum holding force, the hanger comprises reinforcement means.
LOCKING WALL HANGER

FIELD OF THE INVENTION

[0001] The invention relates to the field of hangers, hooks and the like for hanging and fixing objects on a wall.

BACKGROUND AND PRIOR ART

[0002] There exist various types of wall hangers or hooks that can be used to hang an object, in particular a picture on a wall.

[0003] For instance, U.S. Pat. No. 4,509,713 discloses a locking wall hanger having a pointed end, which is designed to create the hole in the wall as the hanger is inserted therethrough. The end point penetrating the wall is terminating at an angle of 30° to provide a (self-boring) tip that, after penetrating of the wall, embeds itself in the rear wall surface being invisible to the user. A mid-parabolic portion of the hanger is adjusted to substantially increase the tension at a tensioned point of the parabola and thus produces a “self-locking” mechanism that provides a secure, stable environment preventing unintended rotation.

[0004] Further, U.S. Pat. No. 3,219,302 discloses various wall hangers, all which have in common a pointed end, a curved semi-circular portion which is very similar to a right-angle bend, a vertical leg connected to the semi-circular portion by a bend that is more gradual than a right-angle bend, a horizontal portion connected to the vertical portion in a right-angle bend, and an exterior vertical leg-portion connected to the horizontal portion by a right-angle bend.

[0005] In inserting this hanger into a wall, the pointed end is pushed perpendicularly with a reciprocal twisting motion into the wall at the desired location. The point forms a hole through the wall and when the point reaches the interior side of the wall the semi-circular portion is eased through the hole. However, the near right-angle shape of semi-circular portion causes enlargement of the hole made through the wall by the point and, in addition, the right-angle between the vertical portion and the horizontal portion further enlarges the hole in the wall.

[0006] Furthermore, the semi-circular portion is free to slide up and down or sideways with the interior surface of the wall. It does not dig into the interior surface of the wall to result in tensioning those parts of the hanger extending between those points where it contacts the inner surface of the wall. While this patent speaks of a snap-in action, the undue enlargement of the hole formed by the point when the semi-circular portion and the right-angle bend between horizontal and vertical portions are forced through the hole contribute very little resistance to keeping the hanger in a stable position.

[0007] When an upward force is applied to the hook portion of the hanger it may become unstable.

[0008] Any spring bias that is provided by the interior portions of this hanger tends to enable the pivoting of the horizontal portion in the wall such that a vertical portion and semi-circular portion are urged away from the wall surface. This contributes to an unstable characteristic of this hanger such that upward forces accidentally applied to the exterior portions of the hanger will cause pivoting of the hanger in the hole and over a period of time will result in such ultimate enlargement of the hole as to allow the hanger to fall.

[0009] U.S. Pat. No. 5,028,090 discloses a picture hanger that can be used with pre-existing holes having diameters up to a quarter inch.

[0010] Moreover, U.S. Patent Application No. 2005/0218284A1 discloses a monkey-hook having a (self-boring) tip for penetrating a drywall, a parabolic curve mid section producing a stable (self-locking) mechanism to prevent unintended rotation and an extended (tilt-back) tip at the opposite end of this single-wire design tilting back and away from the backing of a picture or other object.

[0011] The aforementioned hangers only provide a relatively limited holding force of up to 50 pounds. Further, since the hanger shall provide a self-boring function in such a way that it can intersect a drywall without making use of additional tools either the drywall has to be of a fragile and thin consistence or the diameter of the portion of the hanger being suitable for wall penetration has to be sufficiently small. In either configuration being suitable for a manual assembly, i.e. without making use of additional tools, the maximum load limit is fairly small.

[0012] In a combination with a rather large wire diameter and a fairly thick and/or robust wall, a force being necessary in order to insert the hanger into the wall typically exceeds a maximum force that can be provided manually without making use of tools.

[0013] Another combination with a relatively thick or stable wall and a hanger being relatively small in diameter has the disadvantage that even though manual hanger insertion is possible, the hanger itself due to its small diameter does not provide a sufficiently large load limit.

[0014] Another combination being suitable for manual assembly comprises a thin or a medium sized but fragile or soft wall and a hanger being relatively large in diameter. When the hanger in this combination is in its final assembly position in the wall, due to the softness of the wall, the hanger will carve or engrave into the wall in the direction of gravity hence in the direction opposite to the holding force provided by the hanger.

[0015] The present invention therefore aims to provide a self-locking hanger for mounting in a wall that can be manually inserted into the wall and that provides an increased holding force and a secure, long lasting and reliable fastening for supporting objects on a wall.

SUMMARY OF THE INVENTION

[0016] The present invention provides a wall hanger of the type used with plaster, gypsum, drywall, paneling, wood and the like walls, wherein the hanger is easy to use and includes means for substantially locking it in place at its mounting location against rotation relative to the wall, and against pivoting out of or removal from the mounting hole. The hanger of the present invention comprises a single-pieces spring wire element, i.e. a first metal wire having a tail portion that is adapted to penetrate a wall and therefore being provided with a pointed and sharp free end.

[0017] This pointed tail portion is intended to bore or to drill a passage into the wall through which the first metal wire with its tail portion ahead can be inserted into the wall. The pointed free end of the tail portion allows for a manual assembly or fastening. Typically, the free end of the tail portion is pushed in a twisting motion in the direction perpendicular to the wall’s surface through an intended fixation point.

[0018] Adjacent to the tail portion from a free end of the first metal wire there is provided a resilient C-shaped intermediate portion, having a radius of curvature that is sufficiently large that a passageway in the wall is not enlarged upon insertion of the intermediate portion into the passage.
Hence, the geometry of the intermediate portion is chosen in such a way that it does not substantially enlarge the diameter or the size of the passageway formed by the pointed tip of the wall penetrating tail portion. Further, the C-shaped intermediate portion provides a spring force when the hanger reaches its final assembly position in the wall, thus preventing unintended movement, in particular preventing an unintended pivoting and rotating of the wall hanger.

Adjacent to the intermediate portion there is provided a substantially straight shank portion that is adapted to penetrate the wall, when the hanger reaches the final assembly position, i.e. when the hanger is locked in the wall. In the final assembly position, the shank portion is substantially the portion of the first metal wire that penetrates through the wall, whereas the adjacent intermediate portion and tail portion are entirely located behind the wall's rear side. Since the intermediate portion does not substantially enlarge the passageway in the wall, the shank portion typically has the same diameter as the intermediate portion and remains firmly fitted in the passageway of the wall.

Further, the first metal wire comprises a hook portion that is adjacent to the shank portion. The hook portion has a hook-like geometry and is adapted to receive objects for hanging thereon.

It is intended that the hook portion is not inserted into the wall. It is rather intended that the hook portion may abut against the wall.

The overall geometry of the first metal wire is adapted to provide a locking upon reaching a final assembly position in the wall. Hence, before reaching the final assembly position, in an intermediate assembly position by inserting the first metal wire into the wall from the wall's front side, the pointed tail portion, due to the C-shaped geometry of the intermediate portion is contacting a rear side of the wall and in response to further insertion of the metal wire, the C-shaped intermediate portion, which is adapted to be resiliently deformed applies a spring force to the tail portion and thus provides a locking of the entire metal wire in the wall, when the final assembly position is reached, i.e. when the straight shank portion is nearly entirely inserted into the passageway formed by pointed tail portion.

The wall hanger according to the present invention provides a substantial increase of a maximum holding force. Therefore, at least the hook portion of the first metal wire comprises reinforcement means. By providing at least the hook portion with reinforcement means, a maximum load limit or a maximum holding force provided by the wall hanger can be increased in a very efficient and easy way. For instance, a sufficient reinforcement can already be reached in providing a metal wire with a larger diameter in the region of the hook portion, whereas the diameter of those portions intersecting or being intended to be inserted into the wall remains at a constant and lower diameter range.

In this way inserting the hanger into a wall can be performed in an easy and manual way. At the same time those parts of the hanger, i.e. the hook portion which is not intended for insertion into the wall due to its enlarged diameter, inherently provides an enhanced load limit and an increased holding force.

Further, not only the hook portion but also the adjacent shank portion can be provided with reinforcement means. For instance, the shank portion may have a geometry with a continuously increasing diameter towards the hook portion. Hence, it may comprise a wedge-like shape providing a clamping effect when rigidly pushed into a passageway formed by the pointed tip of the tail portion.

In increasing the diameter of the shank portion that is intended to be inserted into the wall one achieves the additional effect that carving or engraving of the hanger in a drywall in the direction of an externally applied shearing force can be sufficiently reduced thus keeping the shank portion and the hanger in a safe and reliable way at an intended position in the wall.

According to a preferred embodiment of the invention, the reinforcement means comprise a doubling of material by means of a second metal wire. Therefore, at least the hook portion and eventually also at least parts of the shank portion of the first metal wire are reinforced and strengthened by means of a second metal wire. This second metal wire typically has the same diameter as the first metal wire.

Second and first metal wires advantageously comprise a homogeneous diameter over their entire elongation.

According to a preferred embodiment of the invention, the second metal wire and the first metal wire are sections or portions of a common single metal wire that is folded or curved about 180° near the free end of the hook portion. Such a folded, curved or bended configuration provides a reinforcement approach for the hook and/or the shank portion of the hanger which can be easily manufactured, which is inexpensive and not very time-consuming in manufacturing. The 180° bending or curvature interconnecting the first and the second metal wire is located at the far end, hence at the free end of the hook portion.

According to a further embodiment, in a projection parallel to the plane defined by the first metal wire, the second metal wire is aligned substantially parallel to the first metal wire. The first metal wire and its various portions only feature a two-dimensional geometry. Hence, the curvature of the C-shaped intermediate portion as well as the curvature of the hook portion and the straight section of the tail portion and shank portion all lie in a common plane. The second metal wire, which may have a similar or identical shape compared to the hook and/or shank portion of the first wire is positioned in a plane parallel to the plane defined by the first metal wire. Consequently, in this embodiment, the second wire also features a two-dimensional geometry.

According to another embodiment, in a projection perpendicular to the plane, which is defined by the first metal wire, the second wire is substantially overlapping with the first metal wire. Imagining that the two-dimensional first wire is lying flat on a surface, the second wire has at least partially an identical geometry compared to the first wire and seen in a perpendicular, hence vertical projection, the first and the second wire substantially overlap.

According to a further embodiment of the invention, the hook portion, especially when formed by first and second metal wires comprises a S-shaped portion that has a first and a second oppositely curved curvature section and an intermediate abutment piece. The intermediate abutment piece is adjacent to both curvature sections; hence it lies in between them.

The abutment piece is further adapted to get in contact with the front side of the wall, when the hanger reaches its final assembly position in the wall. This way, the abutment piece may prop against the wall's front side and may further define the final assembly position of the hanger in the wall. The curvature section connecting the abutment piece with the straight shank portion is bended by approx. 90° with a rather
small radius of curvature compared to the intermediate portion of the first metal wire such that it is nearly impossible to push this curvature section through the passage in the wall.

[0034] According to a further preferred embodiment, adjacent to the S-shaped portion, the hook portion further comprises a substantially straight snap portion that is inclined with respect to the elongation of the abutment piece at an angle of about 45°. Since the abutment piece in the final assembly position is directed substantially parallel to the surface of the wall, the snap portion is pointing upwards in a 45° configuration. Finally, this substantially straight snap portion serves as the actual hook, which is adapted to hold and to receive objects for hanging thereon.

[0035] The inventive doubling of material covers the snap portion as well as the S-shaped portion. The 180° folding, curving or bending of the common single metal wire defining first and second metal wires is located at the far, hence the free end of the snap portion of the hook portion.

[0036] According to another embodiment, in the region of the snap portion, the first and the second metal wires diverge towards the free end of the hook or the snap portion, respectively. By means of an interjacent elbow piece, virtually connecting the first and the second metal wire, a closed loop is formed. In this configuration, at least in the region of the snap portion, the first and the second metal wires do not elongate in a parallel but in a diverging manner. The elbow piece then provides a section having a curvature slightly exceeding 180°.

[0037] The terms first and second metal wire has not be understood in a literal manner. They are both sections of a single-pieced metal wire that is folded, curved or bended in a loop-like way. The so-formed loop can be interpreted as eye, which in turn is adapted to interact with various applicable fastening means, such as hooks, screws, bolts or the like being in connection with the objects that are intended to be affixed by means of the wall hanger. This loop-like or eye-like configuration of the snap- or hook portion therefore provides a large diversity for a multitude of applicable fastening means. In this way, the range of applicability of the hanger can be advantageously increased. The hanger can be universally applied with various different kinds of fastening means.

[0038] According to another preferred embodiment of the invention, the first and the second metal wire are completely abut to one another. In such a configuration, the first and the second metal wire are substantially aligned parallel to each other. The radius of curvature at the hook-or snap portion’s free end respectively is reduced to a minimum. It substantially corresponds to the diameter of the wire. However, this configuration provides an increased stability at least of the hook and/or shank portion, due to the material doubling. In this way the rigidity and the stiffness of the hook portion and/or the shank portion can be increased by about 100 percent.

[0039] In the same way the maximum load limit of the hook portion and the entire hanger can be enhanced correspondingly. Also, due to the material doubling and the accompanying larger lateral expansion of the wall-penetrating or-intersecting shank portion a carving and engraving of the metal wire due to an applied shear force, e.g. when hanging a heavy weight item on the hanger, can be reduced in an advantageous way.

[0040] According to a further embodiment, the first and the second metal wire at least partially abut to one another. Preferably, the two wire sections abut to one another in the area of the shank portion. In the remaining non-abutting sections, the first and the second metal wires may form a closed loop, an eye or the like.

[0041] In a further preferred embodiment, the first and the second metal wire are completely spaced apart from each other. Hence, first and second metal wires are in a strict non-abutting configuration. Nevertheless, they may extend or run in parallel to each other in a projection perpendicular to the plane defined by the first metal wire. Additionally or alternatively, they may substantially overlap in a projection perpendicular to the plane defined by the first metal wire.

[0042] When the first and the second metal wire are entirely spaced apart from each other, the 180° bended 180° curved elbow piece located at the free end of the snap- or the hook portion, respectively has a curvature larger than the diameter of the wire.

[0043] According to a further embodiment, the second metal wire runs or elongates substantially straight from the hook portion or the snap portions free end to the first wire’s shank portion. Further, in this configuration, in the region of the shank portion, the second and the first wires substantially overlap in a projection perpendicular to the plane defined by the first wire.

[0044] Further, according to another embodiment, the first and the second wire at least abut to one another at the S-shaped portion of the hook portion and/or the shank portion.

[0045] According to a further preferred embodiment, the second metal wire extends or runs at least to the shank portion of the first wire and features a free end that comprises a pointed tip and that extends substantially parallel to the first wire shank portion. The pointed tip or sharpened free end of the second wire points towards the intermediate portion of the first wire. Preferably, the second wire extends with its pointed tip up to the intersection region between the shank portion and the intermediate portion of the first wire.

[0046] In a final assembly position, the shank portion of the first wire as well as the free end of the second wire is almost completely concealed in the wall. The sharpened or pointed tip of free end of the second wire makes it easier to push the second wire and hence the reinforcement of the hanger into the wall. The force that is to be applied in order to push the second wire’s free end into the wall is at maximum comparable to the force necessary to drill or to push the tail portion of the first wire into the wall.

[0047] In this way the invention provides a two-step assembly procedure for affixing the hanger into a wall. In a first step the tail portion with its pointed tip is drilled or pushed through the wall and in a second step, in order to achieve a reinforcement of the hanger; also the free and pointed end of the second metal wire is affixed to the wall by applying an adequate pressure.

[0048] According to a further preferred embodiment of the invention, the free end tip of the second wire is slanted at an angle of approx. 30° with respect to the direction of elongation of the second wire and/or with respect to the direction of elongation of the shank portion of the first wire. In this way also the second wire, hence its free end can be easily pushed and inserted into the wall. The slanted free end of the second metal wire inevitably leads to an asymmetry. Advantageously the longer end of the slanted tip abuts to the first wire, in particular to its shank portion.

[0049] According to a further embodiment, the second wire’s free end is adapted to serve as anti-twist protection
upon insertion of the hanger into the wall’s front side. Since the free end of the second wire is parallel and laterally shifted to the shank portion of the first wire upon the second wire penetrating the wall, the hanger is prevented from pivoting especially in the last final step of the hanger assembly. Otherwise without such an anti-twist protection, the hook portion may twist or tilt just before reaching the final assembly position, in which it is locked due to the spring force provided by the C-shaped intermediate portion.

According to another aspect, the invention provides an adapter piece that is suitable for hanging on the hanger according to the present invention and that comprises at its rear side a cavity that has a geometry that corresponds to the shape of the hanger’s hook portion.

Further, the adapter piece itself has a hook like section for hanging objects thereon.

Moreover, the adapter piece is preferably made of molded plastic, whereas the hanger is provided in tempered steel, brass or comparable metal material.

**BRIEF DESCRIPTION OF THE DRAWINGS**

In the following, preferred embodiments of the invention will be described in detail by making reference to the drawings in which:

- **FIG. 1** depicts a side view of the wall hanger according to a first embodiment,
- **FIG. 2** shows the wall hanger according to FIG. 1 as seen in a front view,
- **FIG. 3** shows the hanger according to FIGS. 1 and 2 as seen from the top,
- **FIG. 4** shows a perspective illustration of the hanger according to FIGS. 1, 2 and 3,
- **FIG. 5** shows the hanger according to FIGS. 1 to 4 in its final assembly position inside the wall,
- **FIG. 6** shows a top view illustration of a loop-like embodiment of the hanger,
- **FIG. 7** depicts the hanger according to FIG. 6 in a front view,
- **FIG. 8** shows the hanger according to FIGS. 6 and 7 in a perspective illustration,
- **FIG. 9** depicts another embodiment of a loop-like shaped hanger as seen from the top,
- **FIG. 10** shows the hanger according to FIG. 9 as seen from the front,
- **FIG. 11** depicts the hanger according to FIGS. 9 and 10 in a perspective illustration,
- **FIG. 12** shows another embodiment of a hanger in a perspective illustration,
- **FIG. 13** shows the hanger according to FIG. 12 as seen from the top,
- **FIG. 14** shows the hanger according to FIGS. 12 and 13 as seen from the front,
- **FIG. 15** depicts the hanger according to FIGS. 12, 13 and 14 as seen from the side,
- **FIG. 16** depicts another embodiment in a perspective illustration, wherein first and second metal wires are parallel but spaced apart from each other,
- **FIG. 17** shows the hanger according to FIG. 16 as seen from the top,
- **FIG. 18** shows the hanger according to FIGS. 16 and 17 as seen from the front,
- **FIG. 19** shows a cross-sectional illustration of the hanger in combination with an adapter piece,
- **FIG. 20** illustrates the adapter piece with hanger in a perspective illustration and
- **FIG. 21** shows hanger and adapter piece as seen from the front.

*FIGS. 1 to 5* show in various illustrations a first embodiment of the hanger 10 according to the present invention. The hanger 10 comprises a metal wire, made of steel or brass for instance, which is eventually even tempered. The entire hanger 10 comprises a single-piece metal wire featuring a material doubling in the region of a hook portion that is protruding from the surface of a wall 32 when the hanger is in its final assembly position as depicted in the cross-sectional illustration of FIG. 5.

The various portions of the metal wire are denoted as tail portion 20 forming a free end of the hanger, which is adapted to be inserted into the wall 32. The pointed tip 22 of the tail portion 20 is inclined at an angle of approx. 30° with respect to the direction of elongation of the substantially straight tail portion 20. Adjacent to the tail portion 20 is arranged an intermediate, C-shaped portion 18 featuring an overall curvature being larger than 90°. Adjacent to the resilient C-shaped intermediate portion 18 there is provided a substantially straight shank portion 16. In the illustration according to FIG. 5, the shank portion 16 is nearly entirely located in the passageway 34 that is generated upon drilling or forcing the pointed end of the tail portion 20 into the wall 32.

Adjacent to the shank portion 16 there is the hook portion protruding from the front side of the wall when the hanger is in its final assembly position as depicted in FIG. 5. The hook portion comprises an S-shaped portion featuring two oppositely curved curvature sections 24, 26 and an intermediate abutment piece 14.

**FIG. 22** shows the lower curvature section 26 in the hook portion further has an upward pointing snout portion 12 leading to the far end of to the other free end of the hanger 10.

In order to provide means for reinforcing the entire wall hanger and in particular the hook and shank portion of the hanger 10, at least the hook portion comprises a doubling of material by means of the wire being folded or curved at about 180° near the free end of the hook portion 28.

As can be seen from the FIGS. 2, 3 and 4 in the region of the hanger 10 defined by the hook portion and the shank portion, a first and a second wire piece are aligned parallel and in an abutting way with respect to each other. These so-called first and second wire pieces are parts of a single common wire that is folded or bent in such a way as can be seen in the FIG. 2, 3 and 4.

Hence, the overall hook portion of the hanger 10 is formed by the tilted snout portions of the first and the second wires 12b, 12a, a second curvature section 26b, 26a, an abutment piece, 14a, 14b, a first curvature section 24b, 24a as well as a shank portion 16b, 16a.

The free end of the second wire, which is located near the end of the shank portion 16b of the first wire also comprises a pointed tip 30, which facilitates insertion of the first and the second wire into the wall.

When the hanger is mounted in the wall, in a first step the far end of the tail portion 22 has to penetrate the wall at an intended position, thus forming a passageway 34 in the wall 32. Then, in a twisting motion, the entire tail portion 20 as well as the entire intermediate portion 18 have to be pushed through the passageway 34. Before reaching the final assembly position, in a final step also the second wire with its pointed...
free end 30 has to penetrate the wall directly adjacent to the passageway 34 formed by the first wire. [0084] A force being necessary to insert the two wires into the wall has to be exerted only at the very beginning, i.e. when the pointed tip of the tail portion 20 intersects the wall and just before reaching the final assembly position, i.e. when the pointed tip of the second wire 30 penetrates the wall. In this way a hanger with an increased load limit and with a substantially increased holding force can be inserted into a wall without the necessity of making use of additional tools.

[0085] FIG. 6, 7 and 8 show a further embodiment of the invention, wherein the first and second metal wires do not entirely abut to one another but where the first and the second wires are of a loop-like or eye-like geometry. Hence, the snap portions of the first wire 42a and the second wire 42b diverge towards the free end of the respective hook portion, where an elbow piece 44a, 48, 44b interconnects the two diverging wire portions 42a and 42b. The elbow piece itself comprises two substantially 90° bended curvature pieces 44a and 44b that are itself interconnected by means of a connecting piece 48 in between them.

[0086] Not only the diverging snap portions 42a, 42b but also the adjacent lower curvature sections 46a and 46b diverge towards the adjacent snap portions 42a and 42b. Apart from this modification, the hanger illustrated in FIGS. 6 through 8 features the same functionality compared to the hanger illustrated in FIGS. 1 through 5. Accordingly, the shank portion and the abutment piece as well as the first curvature section 24 are substantially identical.

[0087] Also, the hanger according to FIGS. 6 through 8 features the same locking functionality as the hanger according to FIGS. 1 to 5. This locking is illustrated by the two positions of the tail portion 20, 20' according to FIG. 5. Whereas the tail portion 20 shows the tail portion in its natural unbiased shape, the dashed tail portion 20' shows the tail portion, when the hanger 10 reaches its final assembly position, in which the pointed tail portion exerts a certain pressure against the rear side of the wall. As a consequence, the resilient deformation of the C-shaped intermediate portion 18 provides a spring force thus locking the hanger in the wall.

[0088] FIGS. 9, 10 and 11 show a further embodiment of a loop-shaped or eye-shaped hanger, where to the hanger according to FIGS. 6, 7 and 8 a connecting piece 58 at the hook portion’s free end has a shorter elongation, thus leading to a smaller angle of divergence of the respective upwards pointing snap portions 52a, 52b. The second curvature sections 56a, 56b as well as the curvature 54a and 54b substantially correspond to respective curvatures 46a, 46b and 44a and 44b according to FIGS. 6, 7 and 8.

[0089] The loop-like or eye-like configuration shown in the embodiments according to FIGS. 6 through 11 provides a variety of applications. For instance, an object having a hook-shaped connecting piece can interact with such a wall-mounted hanger for hanging objects thereon.

[0090] A further embodiment is shown in FIGS. 12, 13, 14 and 15, where the second wire features a geometry that varies from the geometry of the first wire in the area of the hook portion. Here, an upward pointing snap portion 12b adjacent to the lower curvature section 26b is bented at the hook portion’s free end 68 in such a way that the backward pointing second wire 62 runs straight back in a way which is substantially parallel to the direction of the shank portion 16b of the first wire. [0091] In a projection parallel to the plane defined by the first wire, the first wire and the second wire 62 are substantially parallel but spaced apart from each other, as can be seen in FIG. 13. In contrast to the embodiments illustrated in FIGS. 1 through 11, in a projection perpendicular to the plane defined by the first wire, the first and the second wires do not entirely overlap. Hence, in FIG. 12, the second wire 62 has a different geometry than the hook portion defined by the first wire 24b, 26b, 12b.

[0092] FIGS. 16, 17 and 18 further show another embodiment of a hanger, where the first and the second wires do not abut to one another but run parallel and spaced apart from each other.

[0093] In a projection in the plane defined by the first wire, as can be seen in FIG. 17, a part of the single-pieced metal wire forming the second wire 16a, 26a, 12a and 72a is separated from the respective first wire 16b, 26b, 12b and 72b in a range that is larger than the diameter of the wires.

[0094] When inserted into the wall also this hanger configuration provides a kind of eye or loop, which is adapted to interact with hook exhibiting objects being intended for hanging on such a hanger.

[0095] FIGS. 19, 20 and 21 further show an adapter piece which is suitable for hanging on the hanger according to the invention. The adapter piece is preferably made of molded plastic and has at its lower end also a hook portion that may vary in size compared to the hanger’s hook portion protruding from the front side of the wall. The adapter piece has a cavity 82 at its rear side, i.e. that is facing the wall, which has a geometry that corresponds to the shape of the hanger’s hook portion.

[0096] In this way the adapter piece with its cavity can simply slide into the wall-mounted hanger 10. Preferably, the cavity 82 that has an opening at the adapter piece’s rear side also has a protruding nose 84 that gets in contact with the abutment piece 14 as well as with the upward pointing snap portion 12 of the hanger 10. In this way, the adapter piece 80 may engage or latch with the protruding hook portion of the hanger 10.

[0097] Further, the adapter piece may also easily be dismantled or exchanged by another differently shaped adapter piece, which in turn may have a varying geometry and which may provide a different or varying fixing means for objects being adapted to be affixed to the adapter piece and hence to the wall.

LIST OF REFERENCE NUMERALS

10 hanger
12 snap portion
14 abutment piece
16 shank portion
18 intermediate portion
20 tail portion
22 pointed tip
24 curvature
26 curvature
28 elbow piece
30 pointed tip
32 wall
34 passageway
42 snap portion
44 curvature
1. A wall hanger (10) for mounting in a wall for hanging objects thereon comprising a one-piece first metal wire having:
   a wall penetrating tail portion (20) with a pointed free end (22) being adapted to penetrate a wall,
   a resilient C-shaped intermediate portion (18) adjacent to the tail portion (20), the intermediate portion having a radius of curvature sufficiently large that a passageway (34) in the wall (32) is not enlarged upon insertion of the intermediate portion into the passage,
   a substantially straight shank portion (16) adjacent to the intermediate portion (18) being adapted to penetrate the wall (32) upon locking of the hanger in a final assembly position,
   a hook portion (12, 14, 26, 28) adjacent to the shank portion (16) having a hook-like geometry and being adapted to receive objects for hanging thereon,

2. The hanger according to claim 1, wherein the reinforcement means comprising a doubling of material (16a, 24a, 14a, 26a, 12a; 24a, 42a, 44a; 54a, 52a, 56a, 62) by means of a second metal wire.

3. The hanger according to claim 2, wherein the second metal wire (16a, 24a, 14a, 26a, 12a) and the first metal wire (16b, 24b, 14b, 26b, 12b, 18, 20) are sections of a common single metal wire being folded or curved about 180° near the free end (28, 48, 58, 78) of the hook portion.

4. The hanger according to claim 3, wherein in a projection parallel to the plane defined by the first metal wire, the second metal wire (16a, 24a, 14a, 26a, 12a; 24a, 42a, 44a; 54a, 52a, 56a, 62) is aligned substantially parallel to respective portions of the first metal wire (16b, 24b, 14b, 26b, 12b).

5. The hanger according to claim 3, wherein in a projection perpendicular to the plane defined by the first metal wire, the second wire (16a, 24a, 14a, 26a, 12a; 44a, 42a, 46a; 54a, 52a, 56a) is substantially overlapping with the first metal wire (16b, 24b, 14b, 26b, 12b; 44b, 42b, 46b; 54b, 52b, 56b).

6. The hanger according to claim 3, wherein the hook portion comprising an S-shaped portion comprising a first (24a, 24b) and a second (26a, 26b) oppositely curved curvature section and an intermediate abutment piece (14a, 14b), the abutment piece being adapted to get in contact with the front side of the wall when reaching the final assembly position.

7. The hanger according to claim 6, wherein the hook portion adjacent to the S-shaped portion (24a, 24b, 14a, 14b, 26a, 26b) comprising a straight snap portion (12a, 12b) being inclined to the abutment piece at about 45°.

8. The hanger according to claim 7, wherein the first (24b, 52b) and the second metal wire (24a, 52b) at the snap portion diverge towards the free end of the hook portion and form a closed loop by means of an interjacent elbow piece (54a, 58, 54b).

9. The hanger according to claim 2, wherein the second metal wire (16a, 24a, 14a, 26a, 12a) almost completely abuts to the respective portions (16b, 24b, 14b, 26b, 12b) of the first metal wire.

10. The hanger according to claim 2, wherein the first (16b, 24b, 14b, 26b, 12b, 18a, 44b, 42b, 44a) and the second metal wire (16a, 24a, 14a, 26a, 52a, 54a; 46a, 42a, 44a) at least partially abut to one another.

11. The hanger according to claim 4 or 5, wherein the first (72a) and the second metal wire (72a, 62) are spaced apart from each other.

12. The hanger according to claim 4, wherein the second metal wire (62) runs substantially straight from the hook portion’s free end (68) to the first wire’s shank portion (16b).

13. The hanger according to claim 5, wherein the S-shaped portion (24a, 14a, 26a) of the hook portion and the second portion of the second metal wire (16a, 30) extends to the shank portion of the first wire (16b), the free end of the second wire comprising a pointed tip (30) and extends substantially parallel to the first wire’s shank portion (16b).

14. The hanger according to claim 12, wherein the tip (30) of the second wire being slanted at an angle of approximately 30° with respect to the direction of elongation of the second wire.

15. The hanger according to any one of the claims 12 or 13, wherein the second wire’s free end (30) being adapted to serve as an anti-twist protection upon insertion into the wall’s front side.

16. The hanger according to any one of the preceding claims comprising at its rear, wall-facing side, a cavity (82) having a geometry corresponding to the shape of the hanger’s hook portion.

17. An adapter piece (80) being adapted for hanging on a hanger according to one of the preceding claims comprising at its rear, wall-facing side, a cavity (82) having a geometry corresponding to the shape of the hanger’s hook portion.

18. The adapter piece according to claim 17, further comprising a hook portion (86).

19. The adapter piece according to any one of the claims 17 or 18, further comprising a protrusion (84) being adapted to engage with the hanger’s hook portion.