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(54) **Load bearing coupling with adjustable bracket**

Lasttragende Halterung mit verstellbarer Tragkonsole

Elément de support avec console réglable

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Description

Field of the Invention

[0001] The present invention is concerned with a load bearing coupling, in particular a load bearing coupling adapted for use between the leaves of a cavity wall or the like, in order to support the outer leaf of the wall.

Background of the Invention

[0002] The applicants co-pending European Patent application EP1375777 discloses a load bearing bracket for use in supporting the outer leaf of a cavity wall on the inner leaf, via a plurality of said brackets fixed at spaced intervals along the length of the inner leaf. A difficulty can however arise when one or more of the brackets are out of vertical alignment with the remainder of the brackets, requiring the loosening of the nut securing the misaligned bracket, and moving the bracket into alignment with the remaining brackets. Once aligned, the builder must hold the bracket in place while re-tightening the nut, in order to ensure that the bracket remains in the correct position. This can be an awkward operation, and is time consuming.

[0003] DE2439267 discloses a load bearing bracket comprising a main body and a bracket releasably engageable with one another via interengagable elements.

[0004] GB2412952 discloses a load bearing having a bracket and a washer. The bracket defines a support plate having an elongate slot with longitudinal edges and a plurality of apertures located adjacent opposed longitudinal edges of the slot. The washer comprises at least one pair of parallel legs arranged such that they can engage in at least one of the apertures on either side of the slot respectively.

[0005] DE19754023 discloses a load bearing bracket in which longitudinal edges of an elongated slot in a metallic component have numerous spikes directed towards the intermediate component between the wall and the metallic component. Material of the abutting face of the intermediate component is of such a hardness that the spikes press into it only when the screw is tightened, but below the maximum tightening pressure.

[0006] The present invention has therefore been developed to mitigate the above mentioned problem of the prior art.

Summary of the Invention

[0007] The present invention therefore provides a load bearing coupling for connecting a first building element to a second building element according to claim 1.

[0008] Preferably, the plurality of first teeth and the plurality of second teeth are each provided as pairs of substantially parallel rows.

[0009] Preferably, the first teeth are integrally formed with the main body.

[0010] Preferably, the second teeth are integrally formed with the bracket.

[0011] Preferably, the bracket comprises a plate along either edge of which a row of the second teeth are formed.

[0012] Preferably, the bracket is dimensioned to extend, when engaged with the main body, to at least a lower edge of the main body.

[0013] Preferably, the first and second teeth have blunt tips.

10 [0014] Preferably, the first teeth taper towards the tips thereof

[0015] Preferably, the main body comprises means for retaining a support accessory against the main body.

15 [0016] Preferably, the rear wall is provided with an elongate slot therein.

[0017] Preferably, the bracket comprises one or more frangible portions at a lower end thereof.

20 [0018] Preferably, the teeth of one row of the first teeth project in an opposite direction to the teeth of the other row of the first teeth.

25 [0019] As used herein, the term "building element" is intended to mean a construction element or structure such as wall or the like, and in particular the inner and/or outer leaf of a cavity wall, but is not intended to be limited to these examples.

[0020] As used herein, the term "teeth" is intended to mean an array of projections which can cooperate or engage with a similar array of projections in order to fix two components relative to one another, and may be in the form of crenellations, an array of generally parallel ridges, or any other suitable arrangement.

Brief Description of the Drawings

35 [0021] The present invention will now be described with reference to the accompanying drawings, in which;

Figure 1 illustrates a perspective view of a load bearing coupling according to the present invention;

40 Figure 2 illustrates a perspective view of a main body forming part of the coupling illustrated in Figure 1;

45 Figure 3 illustrates a plan view of a bracket forming part of the coupling of the present invention.

Detailed Description of the Drawings

50 [0022] Referring now to the accompanying drawings, there is illustrated a load bearing coupling, generally indicated as 10, which is adapted for location between a pair of building elements such as the leaves of a cavity wall (not shown) or the like, and to retain a support accessory such as a support beam (not shown) on which an outer leaf (not shown) of the cavity wall can be built and supported. The general configuration and operation of such a component is described and shown in co-pending European Patent Application EP 1375777. In use the

coupling 10 is fixed against the outer face of an inner leaf (not shown) of a cavity wall, and in the embodiment illustrated via a bolt B as will be described hereinafter. The coupling 10 could however be fixed in place by any other suitable means. The coupling 10 then serves, when a horizontal support beam (not shown) is secured thereto, to provide a load bearing component on and about which an outer leaf of the cavity wall can be built. The present invention does not concern itself with the abovementioned horizontal support beam, or its connection to the coupling 10, but rather on the capability to vertically adjust, with relative ease, the position of the coupling 10 in order to allow one or more of the couplings 10, which are normally used in multiples along the length of the cavity wall, to be adjusted vertically into alignment with the remaining couplings 10. In this way the support beam (not shown) laid between and supported on the plurality of couplings 10 will be substantially horizontal and therefore provide a suitable platform on which to build and support the outer leaf of the cavity wall.

[0023] The coupling 10 comprises a main body 12 and a bracket 14 which are adapted to be secured in face to face engagement with one another, as will be described hereinafter in detail- As mentioned above, the coupling 10 is secured to the inner leaf of the cavity wall, and the body 12 and bracket 14 secured to one another, by the bolt B projecting from the inner leaf of the cavity wall, along with a suitable nut (not shown). The body 12 includes a pair of tabs 16 each projecting from a respective load bearing surface 18, in addition to a corresponding pair of stops 20 which together define retention means adapted to secure and retain the above-mentioned horizontal support beam (not shown) on the main body 12. This particular arrangement does not form part of the present invention, and could be replaced with any other suitable alternative, in particular any arrangement which is adapted to provide the functionality of same, as described in co-pending European Application EP 1375777.

[0024] In the preferred embodiment illustrated, the body 12 comprises a pair of oppositely disposed and substantially parallel side walls 22 projecting from a rear wall 24. The rear wall 24 is also provided with an elongate slot 26 therein which enables the body 12 to be secured on the bolt B in use. Similarly, the bracket 14 is provided with an aperture 28 therein which is dimensioned to fit over the bolt B. The use of the aperture 28 in the bracket 14 prevents any vertical movement of the bracket 14 once mounted on the bolt B, while the use of the slot 26 facilitates such vertical movement of the main body 12 when mounted on the bolt B to achieve vertical alignment of the main body 12 with other couplings 10 as described above. It is however to be understood, in particular from the following description, that the body 12 could be of any other suitable configuration.

[0025] The body 12 further comprises two generally parallel rows of first teeth 30 which, in the embodiment illustrated, project from and are formed integrally with the

respective side wall 22, such that the first teeth 30 are an integral part of the body 12. This integrity reduces the manufacturing cost of producing the body 12, in addition to providing increased strength to the first teeth 30. The first teeth 30 project beyond the rear wall 24, and are therefore capable of meshing with corresponding rows of second teeth 32 formed along either side of the bracket 14. The first and second teeth 30, 32 together define interengageable elements which, it will be appreciated, could be replaced with any manner of suitable alternative.

[0026] It will thus be appreciated that the body 12 and bracket 14 must be correspondingly dimensioned so that the first teeth 30 and the second teeth 32 are aligned when the body 12 and bracket 14 are brought into register with one another, thereby enabling the rows of teeth 30, 32 to mesh with one another. It can be seen that the rows of second teeth 32 are greater in length than the rows of first teeth 30, and in the preferred embodiment illustrated, almost twice as long as same. This allows the first teeth 30 to mesh with the second teeth 32 at a number of different, in use, vertical positions, thereby allowing the body 12 and the bracket 14 to be offset vertically to one another, in a number of positions. In any of these positions, the body 12 and bracket 14 will be held securely in said position, by virtue of the teeth 30, 32, until the body 12 and bracket 14 are clamped together on the bolt B, by means of a suitable nut (not shown) threaded onto the bolt B.

[0027] Thus the bracket 14 is initially mounted onto the bolt B, and will remain fixed in position, acting as a backing plate for the main body 12 of the coupling 10. The body 12 is then introduced onto the bolt B, with the slot 26 allowing the position of the body 12 to be adjusted up or down with respect to the bracket 14. Once the correct position of the body 12 has been selected, the rear wall 24 is advanced into face to face engagement with the bracket 14, thereby meshing the first teeth 30 with the second teeth 32. The interlocking teeth 30, 32 hold the body 12 in the correct vertical position on the bracket 14, which is itself prevented from any vertical displacement by the bolt B. Thus a builder need not hold the body 12 in position while retrieving and placing a nut (not shown) onto the bolt B, and tightening the nut in order to lock the coupling 10 in place. Similarly, if after the initial fitting of one or more of the couplings 10, the position of the body 12 requires adjustment, the teeth 30, 32 will hold the body 12 and bracket 14 in position while the nut is loosened, and again following the realignment of the body 12 on the bracket 14, before the nut is retightened. This action therefore frees up both of a builders hands. The teeth 30, 32 are preferably provided with blunt tips in order to prevent injury when handling the coupling 10. In addition, each of the first teeth 30 preferably tapers towards the tip thereof, which ensures ease of meshing with the second teeth 32.

[0028] In the preferred embodiment illustrated the teeth one of the rows of second teeth 32 face in the opposite direction to the teeth of the other row of second

teeth 32, which prevents any significant horizontal movement between the body 12 and the bracket 14 when the teeth 30, 32 are meshed or interlocked with one another. This therefore ensures that the body 12 will not be accidentally disengaged from the bracket 14 in a horizontal direction.

[0029] A washer 38 is preferably provided between the rear wall 24 and the nut (not shown) holding the coupling 10 onto the bolt B in use. The washer 38 is preferably square or rectangular in shape, in order to prevent the rotation thereof while tightening the nut, by sizing the washer 38 to just fit between the pair of side walls 22. The washer 38 is not however an essential element of the invention, and could be omitted, or replaced with a round washer or the like.

[0030] It is also preferable, regardless of the vertical alignment between the body 12 and bracket 14, that a lower edge 34 of the bracket 14 is at least flush with, and preferably projects below, a lower edge 36 of the body 12. This ensures that when the coupling 10 is loaded during use, the entire load is transferred through the bracket 14 to the inner leaf of the wall. If the body 12, and in particular the lower edge 36 thereof, were overhanging the lower edge 34 of the bracket 14, possible deformation of the main body 12, about the lower edge 34, could occur as a result of the cantilevered nature of the coupling 10 about the bolt B. The bracket 14 is therefore preferably initially provided with sufficient length to ensure this overlap regardless of the relative vertical positioning between the body 12 and the bracket 14. However, a frangible section 40 may be provided about the lower edge 34, defined by a laser cut line of weakness 42, which enables the frangible section 40 to be removed if not required. Any other suitable means of providing this frangible section 40 could of course be employed.

[0031] It is also preferably that the body 12 is cut and folded from a single sheet of material, thereby significantly reducing the cost and time taken to produce the body 12. In a most preferred arrangement, the outline shape of the body 12, in addition to the profile of the first teeth 30 and the slot 26, is laser cut from a sheet of material such as steel or the like. The first teeth 30 are therefore formed integrally with the body 12. Each of the side walls 22 is then folded normally to the rear wall 24 by any suitable means. The fold line between each side wall 22 and the rear wall 24 is offset in parallel to the tips of the first teeth 30 such that when each wall 22 is folded into position the teeth 30 are left projecting rearwardly beyond the rear wall 24. Thus no further machining or positioning is required to the first teeth 30.

Claims

1. A load bearing coupling (10) for connecting a first building element to a second building element, the coupling comprising a main body (12); a bracket (14) releasably engageable with the main body; and in-

terengageable elements (30, 32) provided on the main body and bracket and adapted to enable the main body and the bracket to be secured together at various relative positions, wherein the interengaging elements comprise a plurality of first teeth (30) on the main body and a plurality of second teeth (32) on the bracket; **characterised in that** the main body comprises a rear wall (24) and a pair of oppositely disposed side walls (22) extending from the rear wall, the first teeth projecting from the side walls beyond the rear wall.

2. A load bearing coupling according to claim 1 in which the plurality of first teeth (30) and the plurality of second teeth (32) are each provided as pairs of substantially parallel rows.
3. A load bearing coupling according to claim 1 or 2 in which the first teeth (30) are integrally formed with the main body.
4. A load bearing coupling according to any preceding claim in which the second teeth (32) are integrally formed with the bracket.
5. A load bearing coupling according to any preceding claim in which the bracket (14) comprises a plate along either edge of which a row of the second teeth (32) are formed.
6. A load bearing coupling according to any preceding claim in which the bracket (14) is dimensioned to extend, when engaged with the main body (12), to at least a lower edge of the main body.
7. A load bearing coupling according to any preceding claim in which the first (30) and second teeth (32) have blunt tips.
8. A load bearing coupling according to any preceding claim in which the first teeth (30) taper towards the tips thereof.
9. A load bearing coupling according to any preceding claim in which the main body (12) comprises means (16, 18, 20) for retaining a support accessory against the main body.
10. A load bearing coupling according to any preceding claim in which the rear wall (24) is provided with an elongate slot (26) therein.
11. A load bearing coupling according to any preceding claim in which the bracket (14) comprises one or more frangible portions (40) at a lower end thereof
12. A load bearing coupling according to any of claims 2 to 11 in which the teeth of one row of the first teeth

(30) project in an opposite direction to the teeth of the other row of the first teeth.

Anspruch, bei der der Hauptkörper (12) Mittel (16, 18, 20) zum Festhalten eines Abstützzubehörteils an dem Hauptkörper aufweist.

Patentansprüche

1. Tragende Kupplung (10) zum Verbinden eines ersten Bauelements mit einem zweiten Bauelement, wobei die Kupplung einen Hauptkörper (12); einen Träger (14), der lösbar mit dem Hauptkörper in Eingriff treten kann; und ineinander in Eingriff bringbare Elemente (30, 32) aufweist, die an dem Hauptkörper und Träger vorgesehen und eingerichtet sind, damit der Hauptkörper und der Träger aneinander an verschiebenen relativen Positionen befestigt werden können, wobei die ineinander greifenden Elemente eine Mehrzahl erster Zähne (30) an dem Hauptkörper und eine Mehrzahl zweiter Zähne (32) an dem Träger aufweisen; **dadurch gekennzeichnet, dass** der Hauptkörper eine Rückwand (24) und ein Paar gegenüberliegend angeordneter Seitenwände (22) aufweist, die sich von der Rückwand erstrecken, wobei die ersten Zähne von den Seitenwänden über die Rückwand hinaus vorstehen.
2. Tragende Kupplung nach Anspruch 1, bei der die Mehrzahl erster Zähne (30) und die Mehrzahl zweiter Zähne (32) jeweils als Paare im Wesentlichen paralleler Reihen vorgesehen sind.
3. Tragende Kupplung nach Anspruch 1 oder 2, bei der die ersten Zähne (30) integriert mit dem Hauptkörper ausgebildet werden.
4. Tragende Kupplung nach einem vorhergehenden Anspruch, bei der die zweiten Zähne (32) integriert mit dem Träger ausgebildet werden.
5. Tragende Kupplung nach einem vorhergehenden Anspruch, bei der der Träger (14) eine Platte aufweist, und entlang jeder Kante derselben eine Reihe der zweiten Zähne (32) ausgebildet ist.
6. Tragende Kupplung nach einem vorhergehenden Anspruch, bei der der Träger (14) bemessen ist, um sich, bei Eingriff mit dem Hauptkörper (12), zu mindestens einer Unterkante des Hauptkörpers zu erstrecken.
7. Tragende Kupplung nach einem vorhergehenden Anspruch, bei der die ersten (30) und zweiten (32) Zähne stumpfe Spitzen aufweisen.
8. Tragende Kupplung nach einem vorhergehenden Anspruch, bei der die ersten Zähne (30) sich in Richtung ihrer Spitzen verjüngen.
9. Tragende Kupplung nach einem vorhergehenden

- 5 10. Tragende Kupplung nach einem vorhergehenden Anspruch, bei der in der Rückwand (24) ein Längsschlitz (26) vorgesehen ist.
- 10 11. Tragende Kupplung nach einem vorhergehenden Anspruch, bei der der Träger (14) einen oder mehrere zerbrechliche Teile (40) an einem unteren Ende desselben aufweist.
- 15 12. Tragende Kupplung nach einem der Ansprüche 2 bis 11, bei der die Zähne einer Reihe der ersten Zähne (30) in einer entgegengesetzten Richtung zu den Zähnen der anderen Reihe der ersten Zähne vorstehen.

Revendications

1. Raccord de support de charge (10) à des fins de raccordement d'un premier élément de construction sur un second élément de construction, le raccord comportant un corps principal (12) ; une console (14) en mesure d'être mise en prise de manière libérable avec le corps principal ; et des éléments en mesure d'être mutuellement mis en prise (30, 32) mis en oeuvre sur le corps principal et la console et adaptés pour permettre au corps principal et à la console d'être assujettis ensemble en différentes positions relatives, dans lequel les éléments mutuellement mis en prise comportent une pluralité de premières dents (30) sur le corps principal et une pluralité de secondes dents (32) sur la console ; **caractérisé en ce que** le corps principal comporte une paroi arrière (24) et une paire de parois latérales disposées de manière opposée (22) s'étendant en provenance de la paroi arrière, les premières dents faisant saillie en provenance desdites parois latérales au-delà de la paroi arrière.
2. Raccord de support de charge selon la revendication 1, dans lequel la pluralité de premières dents (30) et la pluralité de secondes dents (32) sont chacune mises en oeuvre sous la forme de paires de rangées sensiblement parallèles.
3. Raccord de support de charge selon la revendication 1 ou la revendication 2, dans lequel les premières dents (30) sont formées d'une seule pièce avec le corps principal.
4. Raccord de support de charge selon l'une quelconque des revendications précédentes, dans lequel les secondes dents (32) sont formées d'une seule pièce avec la console.

5. Raccord de support de charge selon l'une quelconque des revendications précédentes, dans lequel la console (14) comporte une plaque le long de chaque bord de laquelle une rangée de secondes dents (32) est formée. 5
6. Raccord de support de charge selon l'une quelconque des revendications précédentes, dans lequel la console (14) est dimensionnée pour s'étendre, quand elle est mise en prise avec le corps principal (12), jusque sur au moins un bord inférieure du corps principal. 10
7. Raccord de support de charge selon l'une quelconque des revendications précédentes, dans lequel les premières dents (30) et les secondes dents (32) ont des bouts émoussés. 15
8. Raccord de support de charge selon l'une quelconque des revendications précédentes, dans lequel les premières dents (30) s'effilent vers les bouts de celles-ci. 20
9. Raccord de support de charge selon l'une quelconque des revendications précédentes, dans lequel le corps principal (12) comporte des moyens (16, 18, 20) permettant de retenir un accessoire de support contre le corps principal. 25
10. Raccord de support de charge selon l'une quelconque des revendications précédentes, dans lequel la paroi arrière (24) comporte une fente allongée (26) dans celle-ci. 30
11. Raccord de support de charge selon l'une quelconque des revendications précédentes, dans lequel la console (14) comporte une ou plusieurs parties cassantes (40) au niveau d'une extrémité inférieure de celle-ci. 35
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12. Raccord de support de charge selon l'une quelconque des revendications 2 à 11, dans lequel les dents d'une rangée des premières dents (30) font saillie dans une direction opposée aux dents de l'autre rangée des premières dents. 45

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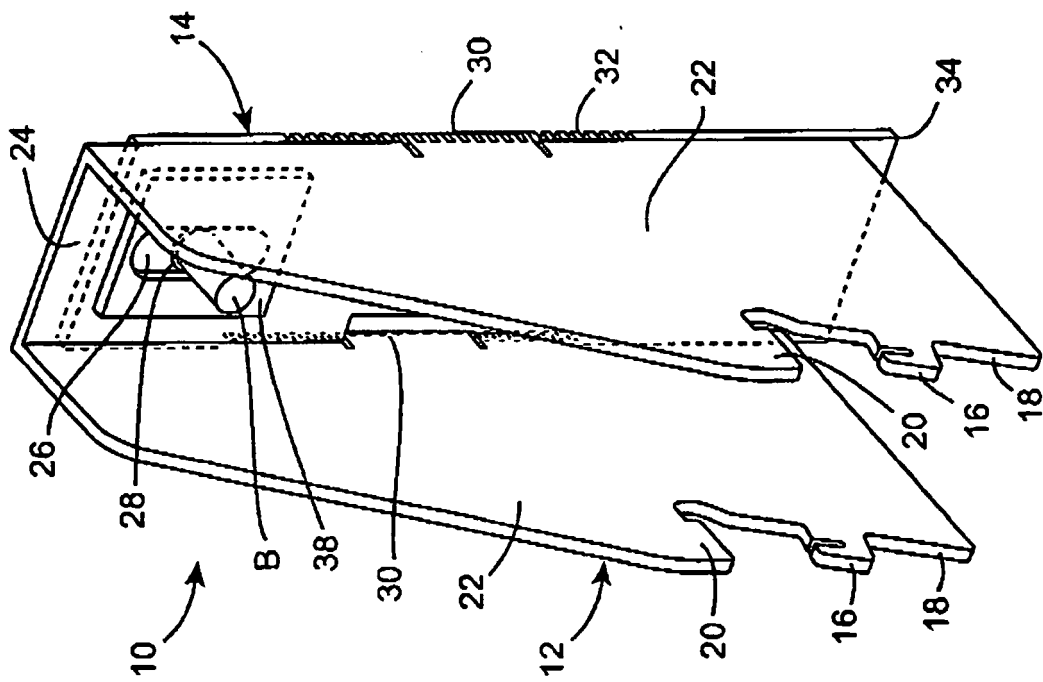


Fig. 1

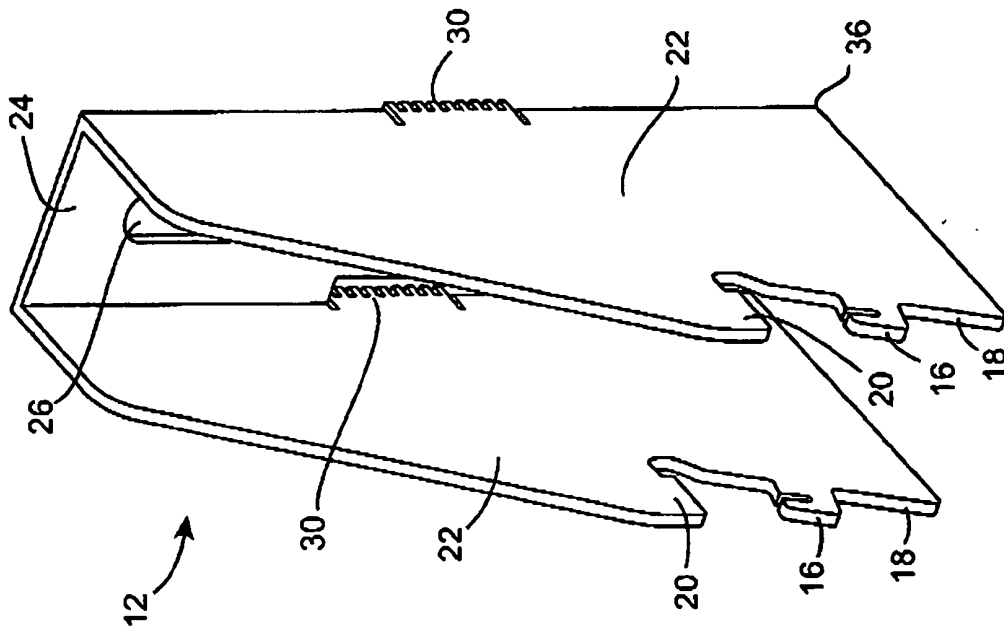


Fig. 2

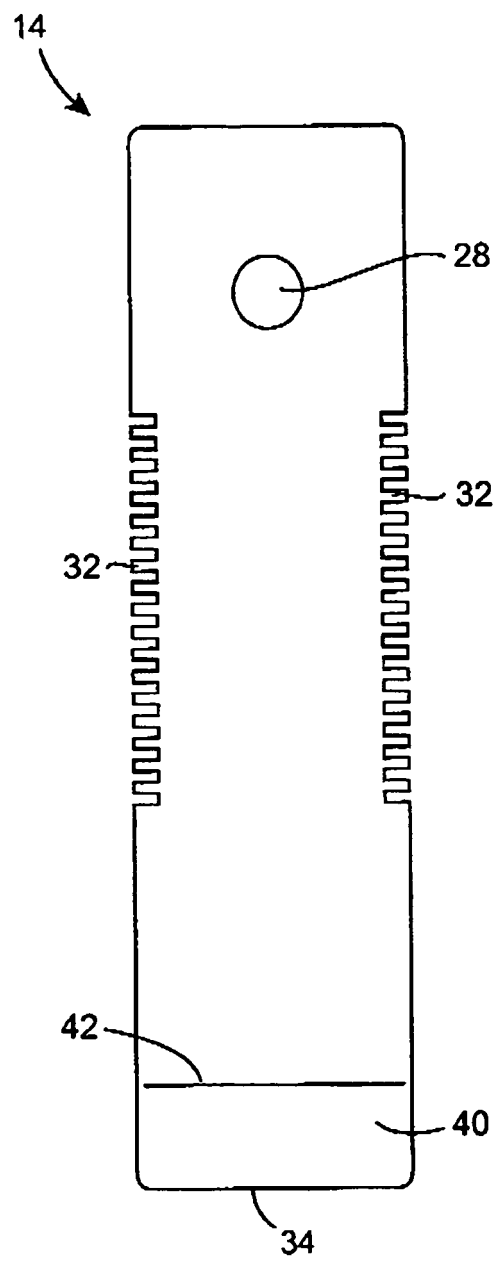


Fig. 3

REFERENCES CITED IN THE DESCRIPTION

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