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<p>(54) Title: PIPE FASTENING CLIP</p>		
<p>(57) Abstract</p>		
<p>Pipe fastening clip for attachment to a wall, comprising a split ring-shaped clip body provided with flanges (D) to cooperate with a fastening screw. One flange is functioning as a nut and is hingedly connected to the clip body along a line of reduced wall thickness (C). The second flange (29) has a slot (30) that merges into the terminal edge of said flange. When closing the clip body around a pipe to be fastened - whereby the two flanges are moved towards one another - the clamping screw threaded into said first flange will initially tilt outwardly and then springingly enter with its shaft into the slot of the second flange. The clip body comprises two substantially inflexible halves (A, B) of plastic material. The first flange has a column-shaped protuberance to receive the e.g. self-tapping type fastening screw and is connected to the respective clip body half by means of a bridging piece of reduced thickness positioned under the dividing plane between the two halves.</p>		

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PIPE FASTENING CLIP

The invention relates to a pipe fastening clip for attachment to a wall, comprising a split ring-shaped clip body provided with flanges to cooperate with a fastening screw, wherein one flange is adapted to function as a nut and is hingedly connected to the clip body along a line
5 of reduced wall thickness, while the second flange is provided with a slot that merges into the terminal edge of said flange, in such a way, that, when closing the clip body around a pipe to be fastened - whereby the two flanges are moved towards one another - the clamping screw threaded into said first flange will - while causing said first flange to
10 turn along - initially tilt outwardly due to its head engaging said second flange and then - while allowing said first flange to turn back - enter with its shaft into the slot of the second flange.

Such a pipe fastening clip is disclosed in EP-0 344 862.

With this well-known fastening clip the clip body is made of a
15 strip of spring steel, whereby the first flange is provided with a nut welded to it, whereas the hinge connection between said flange and the clip body is formed by cuts which extend inwardly from opposite edges.

The invention aims at providing a pipe fastening body which is suitable for universal use and for relatively cheap mass production,
20 whereby certain manufacturing steps such as the welding of nuts on said first flange, may be omitted.

According to the invention this aim is achieved in that the clip body is made of plastic material and comprises two substantially inflexible halves, which are connected along a hinge line at a location
25 diametrically opposite said flanges, said first flange having a column-shaped protuberance extending from the dividing plane between the two halves in a direction turned away from the second flange, said protuberance serving to receive the e.g. self-tapping type fastening screw, and said first flange being connected to the respective clip body
30 half by means of a bridging piece of reduced thickness positioned under said dividing plane.

The clip body of such a pipe clip may be manufactured by injection molding in a rather simple manner.

The column-shaped protuberance of the first flange and the
35 offset position of said flange with the bridging piece connecting the latter with the respective clip body half relative to the dividing plane between the two clip body halves ensure, on one hand, a reliable hold of

the fastening screw in said first flange and offer, on the other hand, the possibility of a tilting angle which is large enough to allow the clip body halves to be closed in case of a pre-mounted fastening screw. The offset position of the connecting bridging piece between said first
5 flange and the respective clip body half contribute to a compact and rigid embracing of the pipe to be fastened by the clip body.

According to a further feature of the invention the arcuate parts of the two clip body halves have their edges bent radially inwardly and a filling of a softer type of plastic is provided within the space
10 between said opposite edges with each pipe clip body half.

Said softer type of plastic filling may serve as a lining around the pipe to be fastened and may be provided through well-known techniques during the injection molding process of the clip body.

It is to be remarked, that prior Dutch patent application
15 9300935 discloses a pipe clip that is integrally formed of plastic. In this case a pipe clip is involved which is adapted to cooperate with a wall fastening clip for central heating pipes. There is no question of a hinging flange.

Further features and advantages of the pipe clip according to
20 the invention will be hereinafter explained with reference to the drawing in which a preferred embodiment of the pipe is shown.

Fig. 1 is an end view of the pipe clip according to the invention, in the closed position and with the filling piece in the outward and inoperative position;

25 fig. 2 is an end view as shown in fig. 1, but now with the filling piece turned inwardly into the operative position;

fig. 3 is a plan view of the pipe clip according to fig. 1;

fig. 4 is a side view of the clip around a pipe;

30 fig. 5 is a cross-sectional view on an enlarged scale of the pipe clip according to fig. 1, along the line V-V in fig. 6, in the opened position and with the lining omitted;

fig. 6 is a plan view of the pipe clip in the opened position according to fig. 5;

35 fig. 7 is a cross-sectional view along the line VII-VII in fig. 6;

fig. 8 is a cross-sectional view of the lining for the pipe clip of fig. 6 and 7 and

fig. 9 is a plan view of the lining of fig. 8.

The pipe clip shown in the drawing comprises two halves A and B of a suitable plastic, such as polyethylene or polypropylene. The clip halves A and B are interconnected by a hinge C and are each provided with a flange D and E respectively positioned diametrically opposite the hinge connection C. Furthermore the clip half A is provided with a base F for fastening the clip on a horizontal or vertical wall.

The clip half A substantially consists of a trough-shaped shell body having side walls 1 and 2 which converge from the dividing plane between the two shell halves towards the base F, and two parallel end walls 3 and 4 dividing a circular opening. The bottom 5 of the trough-like shell body has a dome-shaped projection 6, which serves as a receiving space for the end of a fastening screw, by means of which the pipe clip may be attached to a supporting wall. The upper face of the dome-shaped projection 6 touches the arc of said circular opening.

The base F devines a downwardly (i.e. in a direction turned away from the dividing plane between the two clip halves A and B) opening receiving space 7 for a fastening nut (not shown); two opposite walls 8 and 9 of said receiving space merge at x and y respectively (vide in particular fig. 1) into the walls 1 and 2 of the trough-shaped body of the clip half A. The wall 10 of the other two opposite walls 10 and 11 (vide fig. 7) is connected with the bottom 13 of the receiving space 7 through a thin connecting strip 12, so that this wall may be turned down in the direction of arrow Z in order to allow a fastening nut to be slid from the aside into the space 7.

The flange D of the clip halve A substantially consists of an angle element 14 with a flange portion 14a positioned in the dividing plane between the two clip halves A and B and a flange portion 14b extending from said deviding plane. In the dihedral angle of the flange element 14 there is provided a column-shaped portion 15 provided with a preformed hole, said portion extending from the flange portion 14a downwardly and merging at one side into the upright flange portion 14b. The flange element 14 is connected, with the end turned away from the dividing plane of said flange portion 14b - to the side wall 2 of the trough-shaped body of the respective clip half A through a connecting bridge strip 16. The bridging strip 16 has a reduced thickness to form a hinge connection between the trough-shaped body and the flange element 14, 15. The hinging connecting strip 16 is located about halfway the height of the column-shaped portion 15.

On either side of the flange element 14 - at the level of the lying flange portion 14a - there are provided arm-shaped flange portions 17 and 18 respectively, which extend from the upper part of the wall 2 outwardly and slightly converge relative to one another.

5 The lying flange portion 14a merges at its outer end into a special edge portion 19, which is hingedly connected to the flange portion 14a through two transition portions 21 and 22 of reduced thickness on both sides of an opening 20. The edge portion 19 may be swung over about the hinge line 21, 22 in the arrow direction (fig. 5)
10 from the position shown in fig. 5 and 6 to form a thickening (embossment) of the lying flange portion 14a. The edge portion 19 may thus function as a filling piece or spacing piece, which is disclosed in GM-90 02 878.3. At the edge of the opening 20 turned away from the edge portion 19 there is provided a hook 23 to hold the edge portion 19 in its operative,
15 inwardly swung position against the spring action of the hinge 21, 22.

The clip half B substantially consists of a semi-cylindrical shell 25 having radially inwardly extending edges 26 and 27. The shell body 25 is connected to the wall 1 of the trough-shaped body of the clip half A through a thin connecting strip 28 that constitutes the hinge C.
20 The connecting strip 28 which is tensionless in the opened position according to fig. 5 and 6, deforms to a semi-cylindrical connecting bridge between the clip halves A and B when closing the clip.

The shell body 25 of the clip half B is also provided with a flange 29 having an outwardly opening slot 30 and a recess 31 for
25 receiving the head of a fastening screw (not shown). Wings 32 and 33 respectively are provided at the two side edges of the flange 29 and extend from the flange surface in an upright position; these flanges converge relative to one another outwardly and will - when closing the clip - engage the outer side of the fixed flange arms 17 and 18 of the
30 clip half A.

Fig. 8 and 9 represent a lining of a suitable thermoplastic elastomer, to provide for the desired damping of the sound transfer between clip and pipe.

The contours of the clip halves A and B are represented by dash
35 lines. As shown in fig. 8 and 9, there are two separate lining parts G and H, which are adapted to be received in respective recesses in the clip halves A and B.

C L A I M S

1. A pipe fastening clip for attachment to a wall, comprising a split ring-shaped clip body provided with flanges to cooperate with a fastening screw, wherein one flange is adapted to function as a nut and is hingedly connected to the clip body along a line of reduced wall thickness, while the second flange is provided with a slot that merges into the terminal edge of said flange, in such a way, that, when closing the clip body around a pipe to be fastened - whereby the two flanges are moved towards one another - the clamping screw threaded into said first flange will - while causing said first flange to turn along - initially tilt outwardly due to its head engaging said second flange and then - while allowing said first flange to turn back - enter with its shaft into the slot of the second flange, characterized in that the clip body is made of plastic material and comprises two substantially inflexible halves, which are connected along a hinge line at a location diametrically opposite said flanges, said first flange having a column-shaped protuberance extending from the dividing plane between the two halves in a direction turned away from the second flange, said protuberance serving to receive the e.g. self-tapping type fastening screw, and said first flange being connected to the respective clip body half by means of a bridging piece of reduced thickness positioned under said dividing plane.
2. A pipe fastening clip according to claim 1, characterized in that the column-shaped protuberance is making part of an angle flange element, the lying flange portion of which is located in the dividing plane between the two clip halves, while the terminal edge of the upright flange portion is connected to the respective clip body half through said bridging strip of reduced thickness.
3. A pipe fastening clip according to claim 2, characterized in that the lying flange portion of the angle flange element extends at both sides of the column-shaped protuberance and that the upright flange portion of the flange element substantially covers half the height of the column-shaped protuberance.
4. A pipe fastening clip according to claims 1-3, characterized by a guiding wing extending from the respective clip body half outwardly and provided on either side of the hinging first flange, and a further guiding wing on either side of the fixed second flange, the latter engaging - in the closed position of the clip - the outer side of the wings on either side of said first flange.

5. A pipe fastening clip according to claims 1-4, characterized in that the two clip body halves are provided with radially inwardly directed edges defining the seat for the pipe to be fastened, a lining means of a softer plastic being provided between each two opposite edges.
- 5 6. A pipe fastening clip according to claims 1-5, characterized in that the column-shaped protuberance and/or the lying flange portion of the angle flange element extending on either side thereof is (are) outwardly extended by a filling piece which may be swung over along a hinge line area of reduced thickness so as to be inserted as a filling
10 piece between the two flanges.
7. A pipe fastening clip according to claims 1-6, characterized in that one of the clip halves is provided with an integrally formed base, into which a fastening nut may be laterally inserted.

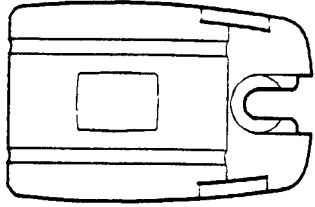


FIG. 3

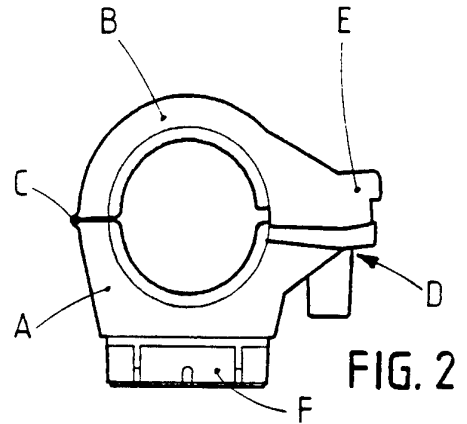


FIG. 2

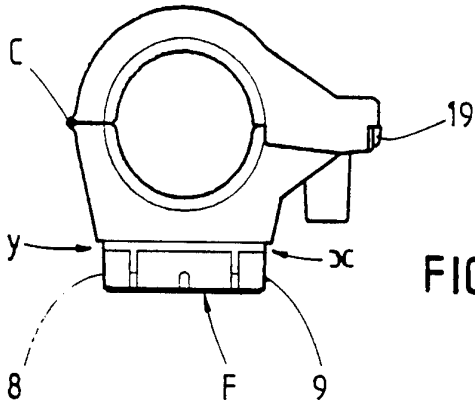


FIG. 1

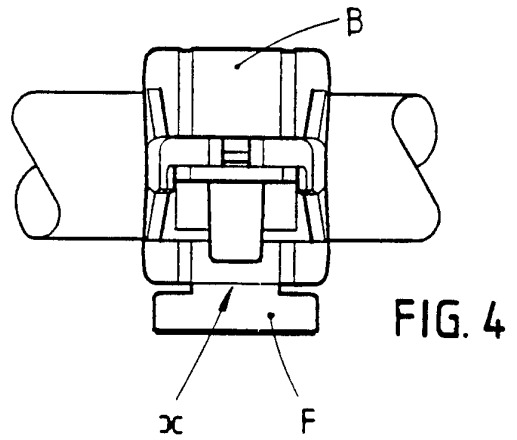


FIG. 4

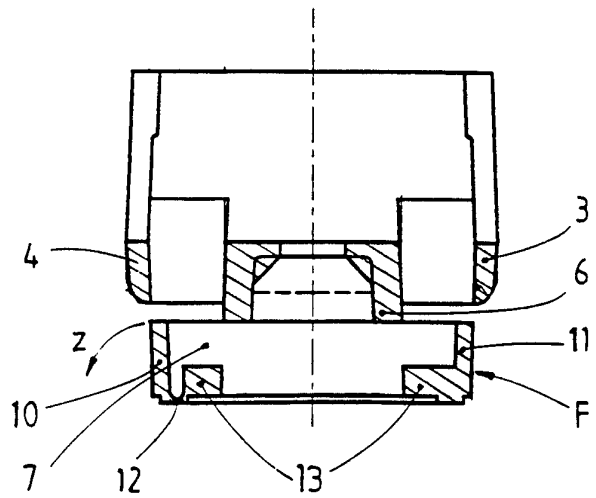


FIG. 7

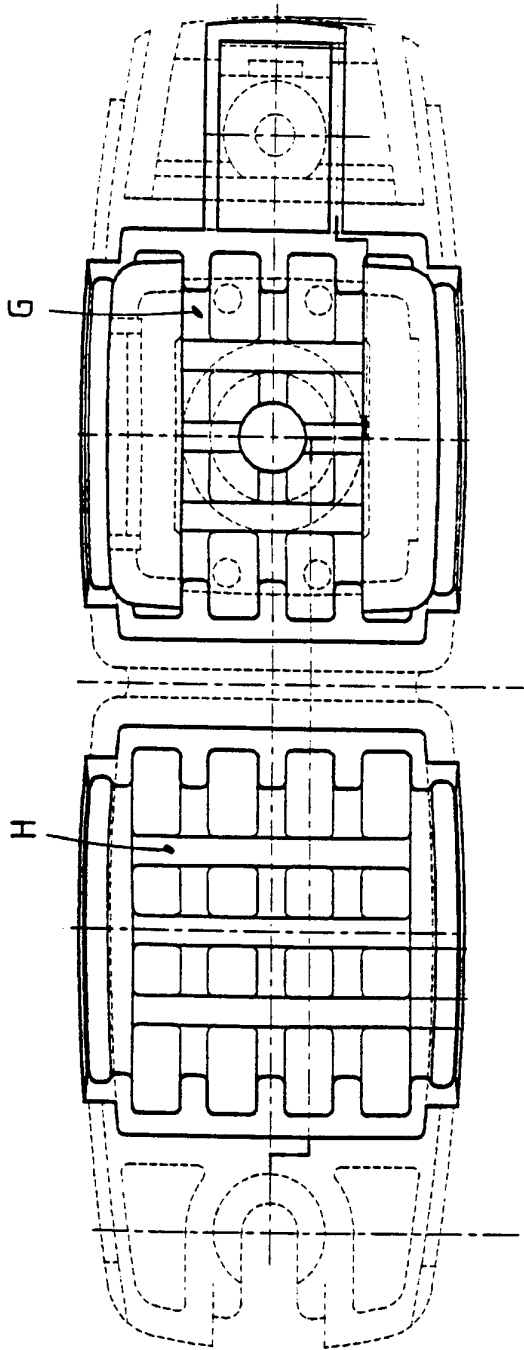


FIG. 9

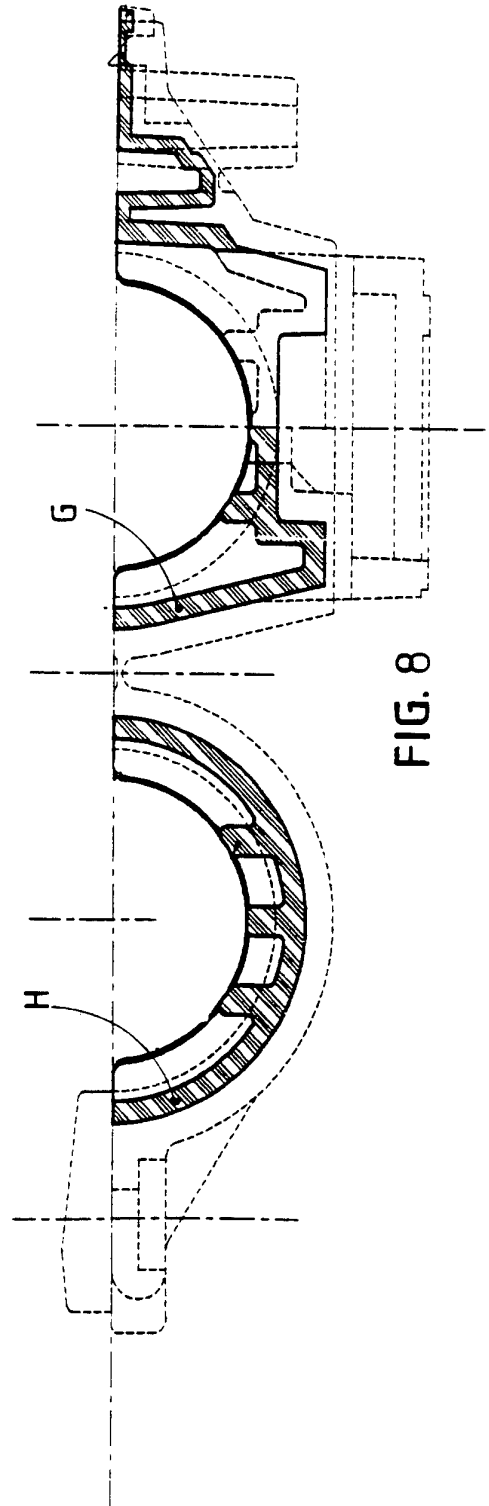


FIG. 8

INTERNATIONAL SEARCH REPORT

International Application No

PCT/NL 94/00305

A. CLASSIFICATION OF SUBJECT MATTER

IPC 6 F16L3/12

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC 6 F16L

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	US,A,4 442 994 (LOGSDON) 17 April 1984 see column 3, line 38 - column 3, line 47; figures	1
A	US,A,4 564 163 (BARNETT) 14 January 1986 see column 2, line 40 - column 2, line 64; claim 12; figures see abstract	1,7
A	DE,U,91 03 296 (J. VAN WALRAVEN BV) 20 June 1991 see claims; figure	1

Further documents are listed in the continuation of box C.

Patent family members are listed in annex.

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Date of the actual completion of the international search

7 March 1995

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Information on patent family members

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Patent document cited in search report	Publication date	Patent family member(s)	Publication date
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US-A-4564163	14-01-86	NONE	
DE-U-9103296	20-06-91	NONE	