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Publication number: **0 447 480 B1**

EUROPEAN PATENT SPECIFICATION

Date of publication of patent specification: **31.08.94** Int. Cl.⁵: **B08B 15/02**

Application number: **90900921.9**

Date of filing: **05.12.89**

International application number:
PCT/GB89/01450

International publication number:
WO 90/06190 (14.06.90 90/14)

APPARATUS FOR USE IN AND A METHOD OF REMOVING ASBESTOS.

Priority: **08.12.88 GB 8828693**

Date of publication of application:
25.09.91 Bulletin 91/39

Publication of the grant of the patent:
31.08.94 Bulletin 94/35

Designated Contracting States:
AT BE DE FR IT NL SE

References cited:
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EP 0 447 480 B1

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Description

This invention relates to apparatus for use in and a method of removing asbestos or other harmful material from pipes or other elongate members (hereinafter for convenience referred to only as pipes).

As is well known, asbestos dust is extremely dangerous to human beings and strict regulations govern the removal of asbestos from surfaces to be stripped.

Asbestos stripping normally takes place in sealed enclosures erected around the surface to be stripped and in which an operative works. Very often small jobs do not warrant the time involved in erecting such an enclosure and in these circumstances it is known to mount a small plastics bag on an area of a pipe to be stripped, the bag having sleeve portions which can be closed around the pipe and a body portion integral with and depending from the sleeve portions. However, these bags suffer from the drawback that they rest on the pipe and become contaminated with asbestos dust so that it is impossible to clean off the pipe when the asbestos lagging has been removed. Also, it is not possible to reduce the interior of the bags to a sub-atmospheric pressure as to do so would cause the bag to cling to the pipe.

According to a first aspect of the present invention there is provided apparatus for use in removing asbestos or other harmful material from pipes, comprising a flexible bag, which is made at least in part of transparent plastics material and which can be mounted on a pipe, and a cage for supporting the bag clear of an area of the pipe to be stripped, the cage being made of a plurality of parts which are releasably connected together so that they can be assembled about the pipe, wherein the bag has two sleeve portions which can be sealed to the pipe in spaced relationship with respect to one another and an openable seam extending along and between the two sleeve portions and the cage itself includes support means by which the cage can be supported by the pipe from which asbestos or other harmful material is to be removed.

Preferably, the seam is closable by sliding clasp fastener means.

Preferably, the bag is provided on its external surface with means for attaching the bag to the cage. Such means may be in the form of tags which together with the bag define sleeves for receiving individual parts of the cage.

Preferably, the bag has two hand receiving pockets which may be in the shape of gauntlets and which allow an operative access to an area of the pipe within the bag.

The bag may also have a vacuum connector for connecting a source of negative pressure to the interior of the bag and/or a water supply connector enabling water to be sprayed on asbestos lagging on the pipe.

According to a second aspect of the invention, there is provided a method of removing asbestos or other harmful material from pipes using apparatus according to the first aspect of the invention, comprising the steps of mounting the flexible bag on the pipe, assembling the cage on the pipe and fixing the bag to the cage, sealing the bag to the pipe, and stripping asbestos or other harmful materials from the pipe using one or more tools contained within the bag.

Preferably, the interior of the bag is connected to a source of negative pressure during the stripping operation.

Preferably, the asbestos is wetted prior to being stripped from the pipe.

The invention will now be more particularly described with reference to the accompanying drawings, in which:-

Figure 1 is a perspective view of one embodiment of apparatus according to the first aspect of the invention, assembled on a pipe to be stripped of asbestos,

Figure 2 is a perspective view of another embodiment of apparatus according to the first aspect of the invention, assembled on T-junction pipes to be stripped of asbestos,

Figures 3a and 3d show various connectors used to connect together the parts of the cage of Figure 1 or Figure 2, and

Figure 4 is a perspective view of apparatus similar to that shown in Figure 1 with parts omitted for clarity, but showing a pair of gauntlets.

Referring firstly to Figure 1 of the drawings, the apparatus shown therein comprises a flexible bag 10 made of transparent plastics material, e.g. polyethylene, and a cage 11 for supporting the bag 10 clear of an area of a pipe 12 to be stripped.

The bag 10 comprises a body portion 10a and two sleeves 10b separated from one another by the body portion 10a. An openable seam 13 extends along the length of each sleeve 10b and between the sleeves along the top of the body portion 10a. The seam 13 is closed by an air-tight (or substantially air-tight) plastics sliding clasp fastener 14.

Tags 15 are attached to the external surface of the bag 10 and the tags 15 together with the plastics material of the bag define sleeves 16 for receiving parts of the cage 11.

The bag 10 also has two hand receivable pockets 17, which extend into the bag 10 and which are preferably in the shape of gauntlets as shown in Figure 4, a vacuum connector 18, and a water

supply connector 19, all welded to the bag.

The cage 11 comprises a plurality of rigid tubes, which may be box-section tubes 20, and a plurality of connectors 21, 22, 23 and 24 (see Figures 3a to 3d). The cage 11 is made up of three rectangular frame sections 11a, 11b and 11c spaced apart in the direction of the longitudinal extent of the pipe 12 and joined one to another by four tubes 20. The central frame section 11b is itself made up of four tubes 20 joined together at the four corners of the frame by connectors 21 (see Figure 3a) having a body part 21a and four projections 21b - 21e, the projections 21b and 21c being push-fitted in the ends of two tubes 20 of the frame section 11b and the projections 21d and 21e being push-fitted in the ends of two tubes 20 connected respectively to the frame sections 11a and 11c. The frame sections 11a and 11c are each made up of four outer tubes 20 which are joined together at the corners by connectors 22 (see Figure 3b) having a body part 22a and three projections 22b - 22d, and two short inner tubes 20. The inner tubes 20 extend between respective connectors 24 (see Figure 3d) on the two vertical outer tubes 20 and the connector 23 (see Figure 3c) on the uppermost outer horizontal tube 20, to provide within the upper end of the rectangular frame section an inverted V-shaped support 25 which rests on the pipe 12 to support the uppermost tube 20 clear of the pipe 12. The connectors 23 and 24 each include a sleeve 23a and 24a, respectively which is slidable over an outer tube 20, and connector 23 has two projections 23b and 23c which are push-fitted in ends of the two inner short tubes 20, whereas each connector 24 has a single projection 24b which is push-fitted in the other end of a respective short inner tube 20.

When it is desired to strip insulation from an area of a pipe 12, the bag 10 is mounted on the pipe from below and the seam 13 is closed by the sliding clasp fastener 14. The sleeves 10b are then each folded over and sealed to the pipe 12 by tape 26.

After mounting the bag 10 on the pipe 12, the cage is assembled and during assembly many of the tubes 20 are passed through respective sleeves 16 on the bag 10 so that the body portion 10a of the bag 10 is supported by the cage 11 clear of the pipe 12.

A source of negative pressure, e.g. an "H" type vacuum cleaner or vacuum interceptor is connected to the connector 18. The asbestos cladding on the pipe 12 is then removed using one or more tools (not shown) contained within the bag 10, access to the tools being gained by the hands of an operative being placed in the hand receiving pockets or gauntlets 17.

If it is desired to wet the asbestos prior to stripping, a water jet can be connected to the connector 19.

The bag 10 and cage 11 can be of any desired size to suit the dimensions of a pipe or other elongate member to be stripped and can be used to remove not only asbestos but also other harmful materials.

The apparatus can be used to strip vertical as well as horizontal pipes, but in this case it is desirable to provide an additional hand receivable pocket in the bag 10 on the side thereof opposite to the pockets 17.

The apparatus may also be used to strip T-junction pipes as shown in Figure 2 and in this case the bag 10' must be provided with a third sleeve 10c which is joined to each sleeve 10b by an openable seam. Also, in this case the cage 11' is of T-shaped construction and the bag 10' has two pairs of hand receivable pockets 17a and 17b, respectively.

The above embodiments are given by way of example only and various modifications will be apparent to persons skilled in the art without departing from the scope of the invention as defined in the appended claims. For example, not all of the bag 10, 10' need be transparent; it could instead just have one or more transparent windows so that an operative can see to strip the asbestos from the pipe. In this case, a main part of the bag could for example be of "Valeron", a very strong, but not optically transparent, plastics material available from Van Leer Flexibles Ltd., of Poole, Dorset, England, and the transparent window or windows could be of polyethylene. Also, the slidable clasp fastener could be replaced by any other appropriate fastener, such as a hook and eye fastener of the type sold under the name "Velcro" (RTM).

Claims

1. Apparatus for use in removing asbestos or other harmful material from pipes (12), comprising a flexible bag (10), which is made at least in part of transparent plastics material and which can be mounted on a pipe, and a cage (11) for supporting the bag clear of an area of the pipe to be stripped, the cage being made of a plurality of parts which are releasably connected together so that they can be assembled about the pipe, characterised in that the bag has two sleeve portions (10a, 10b) which can be sealed to the pipe in spaced relationship with respect to one another and an openable seam (13) extending along and between the two sleeve portions and the cage itself includes support means (25) by which the cage can be supported by the pipe from which

asbestos or other harmful material is to be removed.

2. Apparatus as claimed in Claim 1, wherein the seam is closable by sliding clasp fastener means (14). 5
3. Apparatus as claimed in Claim 1 or Claim 2, wherein the bag is provided on its external surface with means for attaching the bag to the cage. 10
4. Apparatus as claimed in Claim 3, wherein said attaching means comprises tags (15) which together with the bag define sleeves (16) for receiving individual parts of the cage. 15
5. Apparatus as claimed in any one of Claims 1 to 4, wherein the bag has two hand receiving pockets (17) which allow an operative access to an area of the pipe within the bag. 20
6. Apparatus as claimed in Claim 5, wherein the pockets are in the shape of gauntlets. 25
7. Apparatus as claimed in any one of Claims 1 to 6, wherein the bag has a vacuum connector (18) for connecting a source of negative pressure to the interior of the bag. 30
8. Apparatus as claimed in any one of Claims 1 to 7, wherein the bag has a water supply connector (19) enabling water to be sprayed on asbestos lagging on the pipe. 35
9. A method of removing asbestos or other harmful material from pipes using apparatus according to any one of the preceding claims, comprising the steps of mounting the flexible bag on the pipe, assembling the cage on the pipe and fixing the bag to the cage, sealing the bag to the pipe, and stripping the asbestos or other harmful material from the pipe using one or more tools contained within the bag. 40
10. A method as claimed in Claim 9, wherein the interior of the bag is connected to a source of negative pressure during the stripping operation. 45
11. A method as claimed in Claim 9 or Claim 10, wherein the asbestos is wetted prior to being stripped from the pipe. 50

Patentansprüche

1. Vorrichtung zur Entfernung von Asbest oder anderer schädlicher Materie von Rohrleitungen

(12), mit einem flexiblen Sack (10), welcher wenigstens teilweise aus transparentem Kunststoffmaterial hergestellt ist und, welcher auf die Rohrleitung montiert werden kann, und einem Käfig (11), um den Sack frei auf einem zu schälenden Rohrleitungsbereich zu tragen, wobei der Käfig aus mehreren Teilen besteht, welche lösbar miteinander verbunden sind, so dass sie um die Rohrleitung herum zusammengebaut werden können, dadurch gekennzeichnet, dass der Sack zwei schlauchförmige Teile (10a,10b), welche mit der Rohrleitung in Abstand zueinander abgedichtet werden können und eine zu öffnende Naht (13), welche sich entlang und zwischen den beiden schlauchförmigen Teilen erstreckt, hat, und der Käfig selbst Tragmittel (25) hat, mit Hilfe derer der Käfig von der Rohrleitung, von welcher der Asbest oder die schädliche Materie zu entfernen ist, getragen werden kann.

2. Vorrichtung nach Anspruch 1, in welcher die Naht mittels Gleitklammerbefestigungsmitteln (14) verschliessbar ist.
3. Vorrichtung nach Anspruch 1 oder 2, bei welcher der Sack auf seiner Aussenfläche mit Mitteln zum Befestigung des Sackes am Käfig versehen ist.
4. Vorrichtung nach Anspruch 3, bei welcher die Befestigungsmittel Oesen sind, welche zusammen mit dem Sack Schläuche (16) zur Aufnahme individueller Teile des Käfigs bilden.
5. Vorrichtung nach einem der Ansprüche 1 bis 4, bei welcher der Sack zwei Taschen (17) zur Aufnahme einer Hand hat, welche Zugang zum Arbeiten zu einem Rohrleitungsbereich im Sack ermöglichen.
6. Vorrichtung nach Anspruch 5, bei welcher die Taschen die Form von Handschuhen haben.
7. Vorrichtung nach einem der Ansprüche 1 bis 6, bei welcher der Sack einen Vakuumananschluss (18) hat, um eine Quelle negativen Drucks an das Innere des Sackes anzuschliessen.
8. Vorrichtung nach einem der Ansprüche 1 bis 7, bei welcher der Sack einen Wasseranschluss (19) hat, welcher die Besprühung des die Rohrleitung umgebenden Asbestes mit Wasser ermöglicht.

9. Verfahren zur Entfernung von Asbest oder anderer schädlicher Materie von Rohrleitungen,

welche eine Vorrichtung nach einem der vorangehenden Ansprüche verwendet, mit den Verfahrensschritten des Aufbaus des flexiblen Sackes auf der Rohrleitung, des Zusammenbaus des Käfigs auf der Rohrleitung, des Befestigen des Sackes an dem Käfig, des Abdichtens des Käfigs gegenüber der Rohrleitung und des Abstreifens des Asbestes oder anderer schädlicher Materie von der Rohrleitung mit Hilfe eines oder mehrere im Sack befindlicher Werkzeuge.

10. Verfahren nach Anspruch 9, bei welchem das Innere des Sackes mit einer Quelle negativen Druckes während des Abstreifvorgangs verbunden ist. 15
11. Verfahren nach Anspruch 9 oder 10, bei welchem der Asbest vor dem Abstreifen vom Rohr benetzt wird. 20

Revendications

1. Dispositif pour enlever de l'asbeste ou une autre matière nuisible de conduites (12), comprenant un sac (10) flexible, fait au moins partiellement de matière synthétique transparente et pouvant être monté sur une conduite, et une cage (11) pour porter le sac librement sur une zone de conduite à dépouiller, ladite cage étant formée de plusieurs éléments connectés ensemble de façon amovible de sorte qu'ils peuvent être assemblés autour de la conduite, caractérisé en ce que le sac a deux parties (10a,10b) en forme de boyau qui peuvent être étanchéifiées par rapport à la conduite à une certaine distance l'une de l'autre et un joint (13) pouvant être ouvert et s'étendant le long et entre les deux parties de boyaux et que la cage elle-même comprend des moyens de support (25) à l'aide desquels la cage peut être portée par la conduite de laquelle l'asbeste ou une autre matière nuisible doit être enlevée. 25
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35
40
45
2. Dispositif selon la revendication 1, dans lequel ledit joint peut être fermé à l'aide d'un moyen de fermeture à fermeture coulissant (14). 50
3. Dispositif selon la revendication 1 ou 2, dans lequel ledit sac est pourvu sur sa surface extérieure d'un moyen pour fixer ledit sac à la cage. 55
4. Dispositif selon la revendication 3, dans lequel ledit moyen de fixation comprend des oeillettes (15) qui définissent ensemble avec le sac des boyaux (16) pour recevoir des parties indivi-

duelles de la cage.

5. Dispositif selon une quelconque des revendications 1 à 4, dans lequel ledit sac a deux poches (17) pour recevoir une main qui permettent un accès opérationnel à une zone de la conduite dans le sac.
6. Dispositif selon la revendication 5, dans lequel les poches ont la forme de gants.
7. Dispositif selon une des revendications 1 à 6, dans lequel le sac a un connecteur de vide (18) pour connecter une source de pression négative à l'intérieur du sac.
8. Dispositif selon une des revendications 1 à 7, dans lequel le sac a un connecteur d'alimentation d'eau (19) permettant d'arroser d'eau l'asbeste entourant la conduite.
9. Procédé pour enlever l'asbeste ou une autre matière nuisible de tuyaux en utilisant un dispositif selon une quelconque des revendications précédentes, comprenant les étapes de monter un sac flexible sur la conduite, d'assembler la cage sur la conduite et de fixer le sac à la cage, d'étanchéifier le sac par rapport à la conduite et d'enlever l'asbeste ou autre matière nuisible de la conduite en utilisant un ou plusieurs outils contenus dans le sac.
10. Procédé selon la revendication 9, dans lequel l'intérieur du sac est connecté à une source de pression négative pendant l'opération d'enlèvement.
11. Procédé selon la revendication 9 ou 10, dans lequel l'asbeste est humidifié avant d'être enlevé de la conduite.

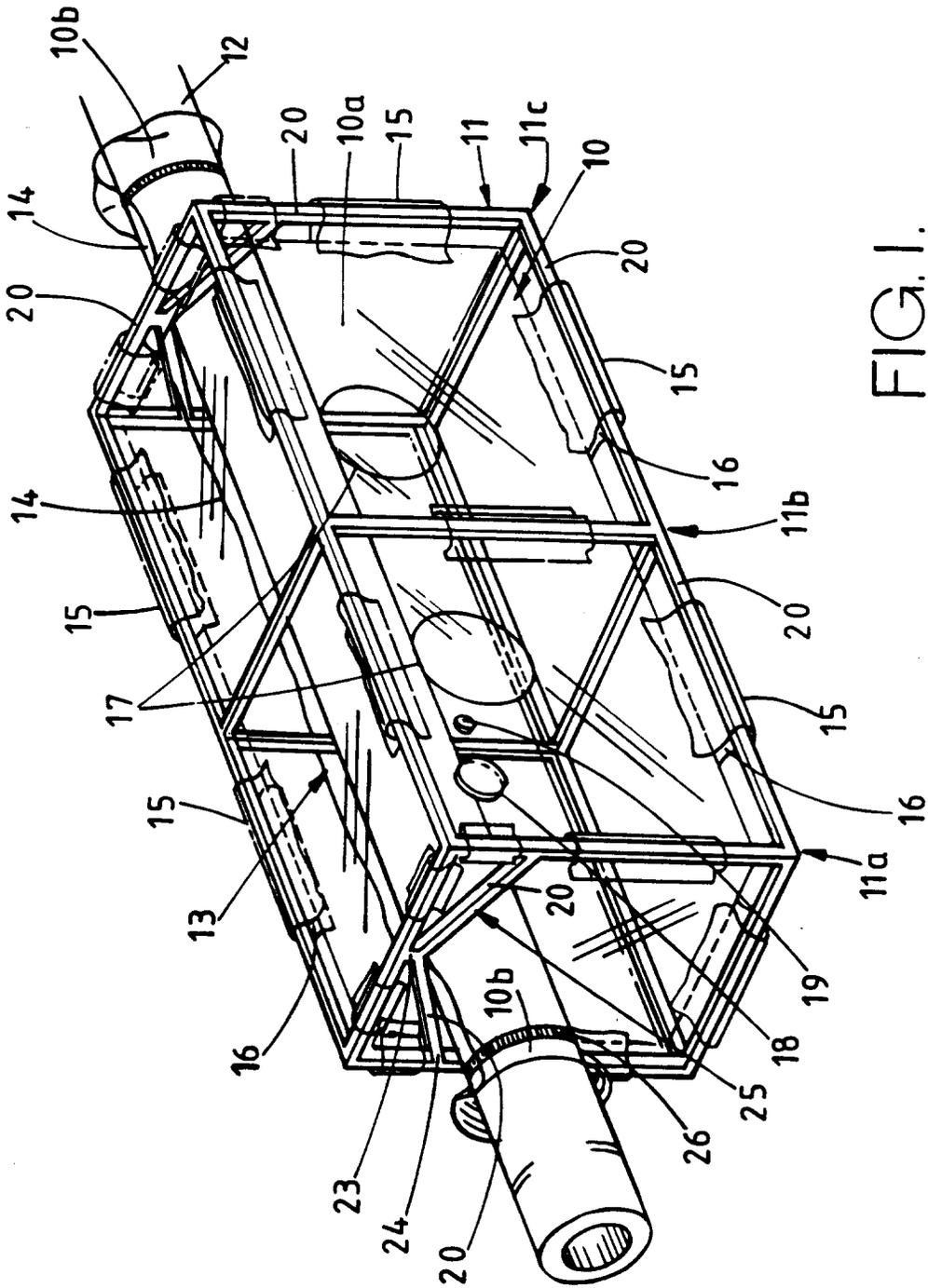


FIG. 1.

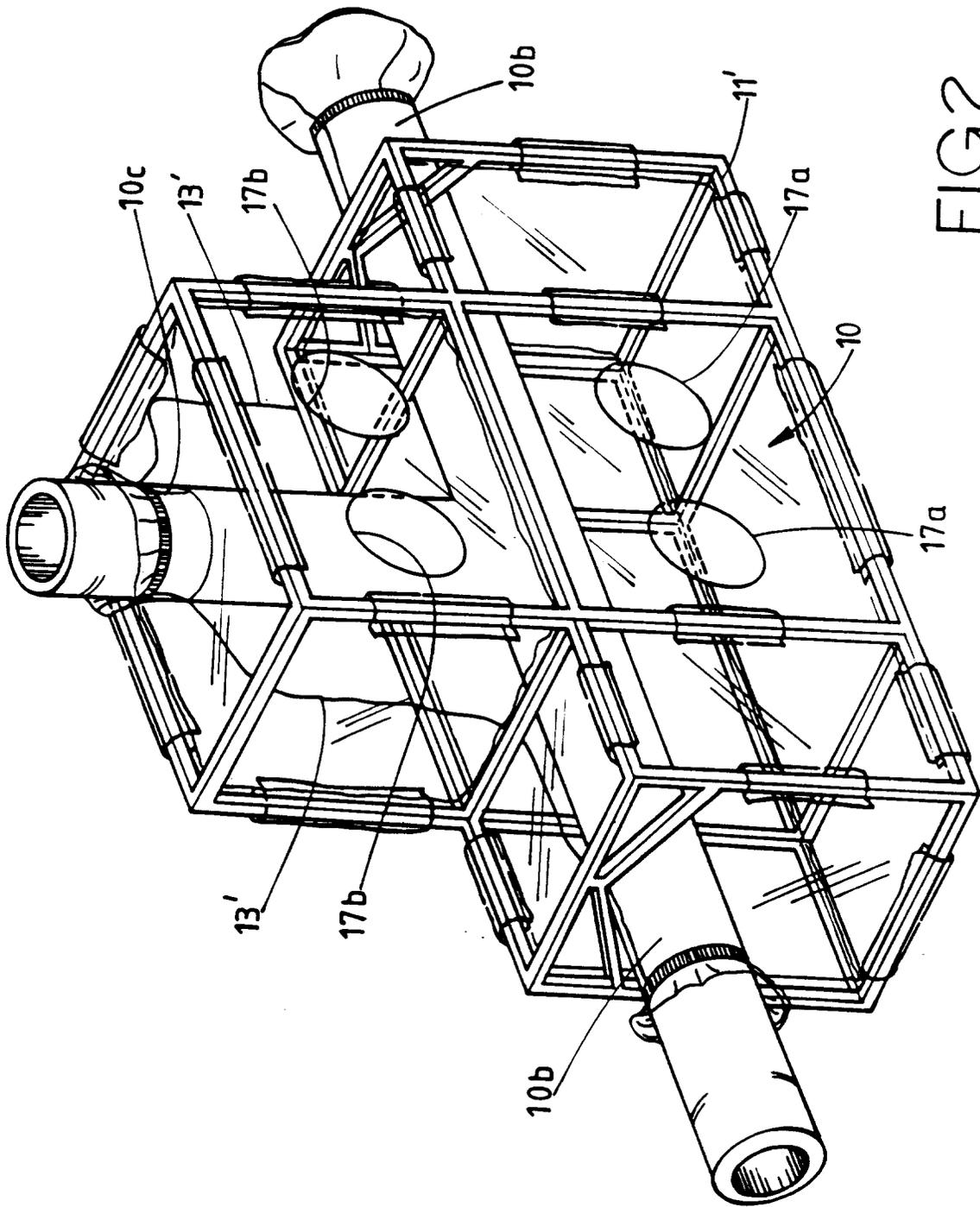


FIG.2.

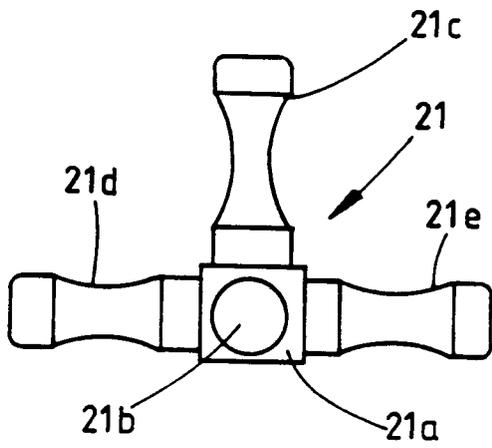


FIG. 3(a)

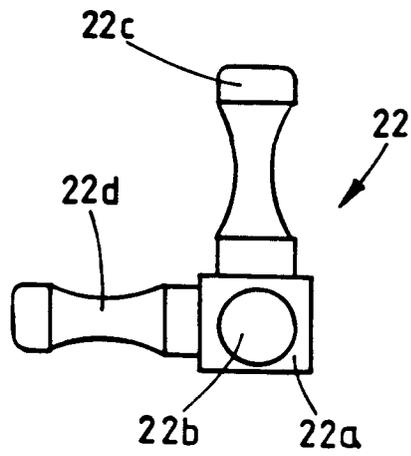


FIG. 3(b)

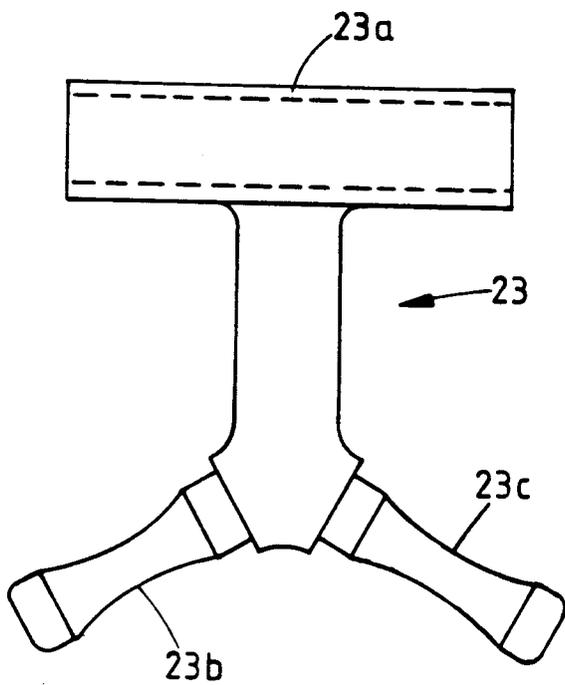


FIG. 3(c)

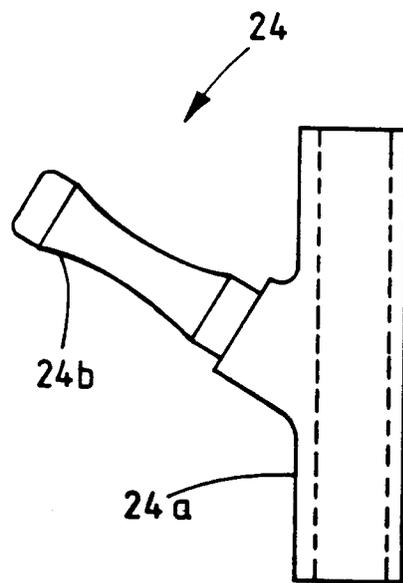


FIG. 3(d)

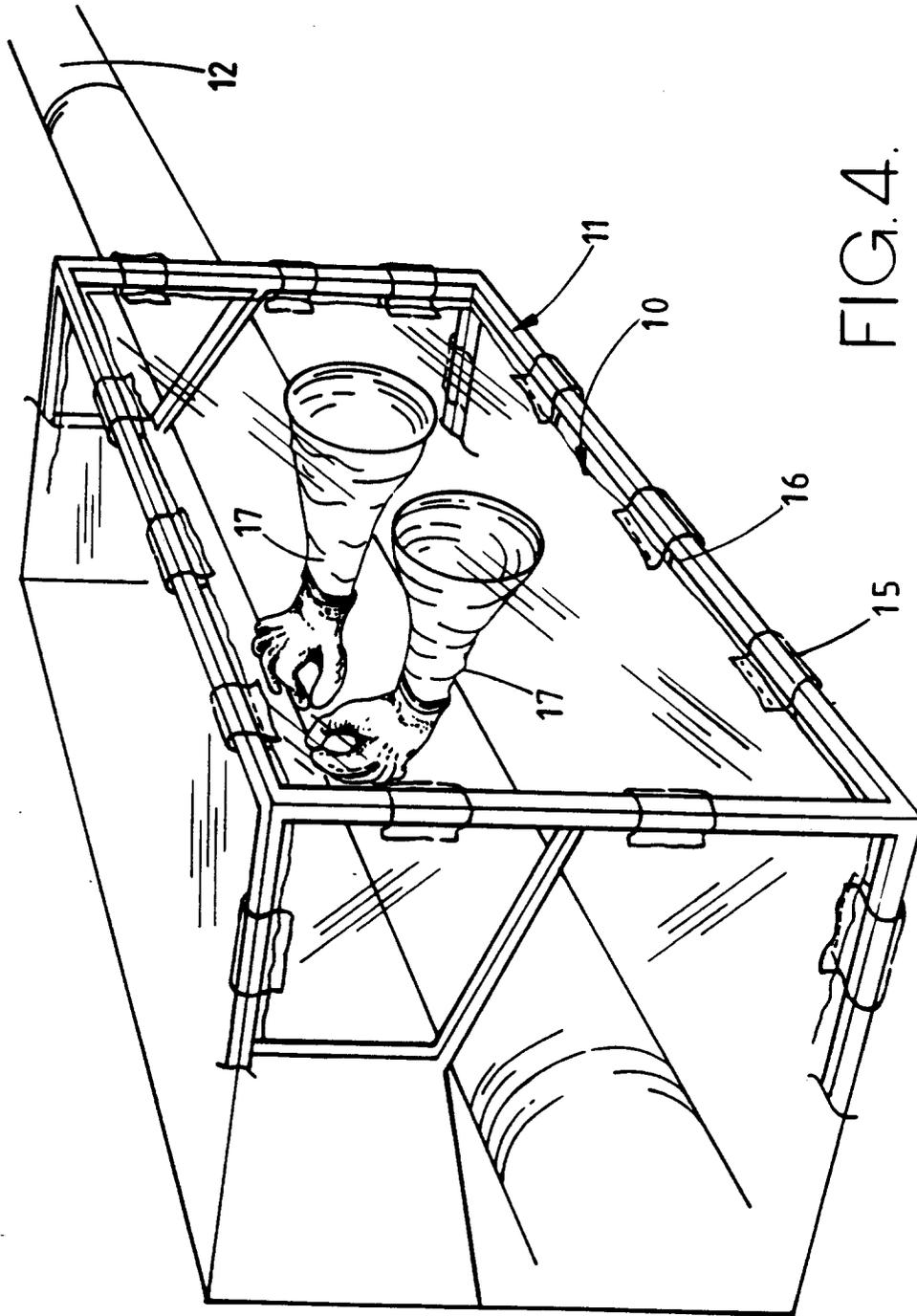


FIG. 4.