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A pipe fitting

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ABSTRACT

A pipe fitting 10 is disclosed which includes a fitting body 12 defining a flow passage there through having one end and another end. The pipe fitting 10
5 also includes one pipe coupling arrangement 18 mounted on said fitting body 12 towards said one end of the flow passage for coupling to a pipe. The fitting 10 also includes at least two other pipe coupling arrangements 20, 26 spaced from said one end of the flow passage for coupling to at least two other pipes 62 respectively. Each of the other pipe coupling arrangements 20, 26 includes a
10 gang of pipe coupling formations in the form of concentric sockets that is closed off by a blank wall. The blank wall can be opened optionally and selectively to prepare the coupling formation for coupling the pipe coupling formation to a pipe.

15 FIG. 11 FOR PUBLICATION

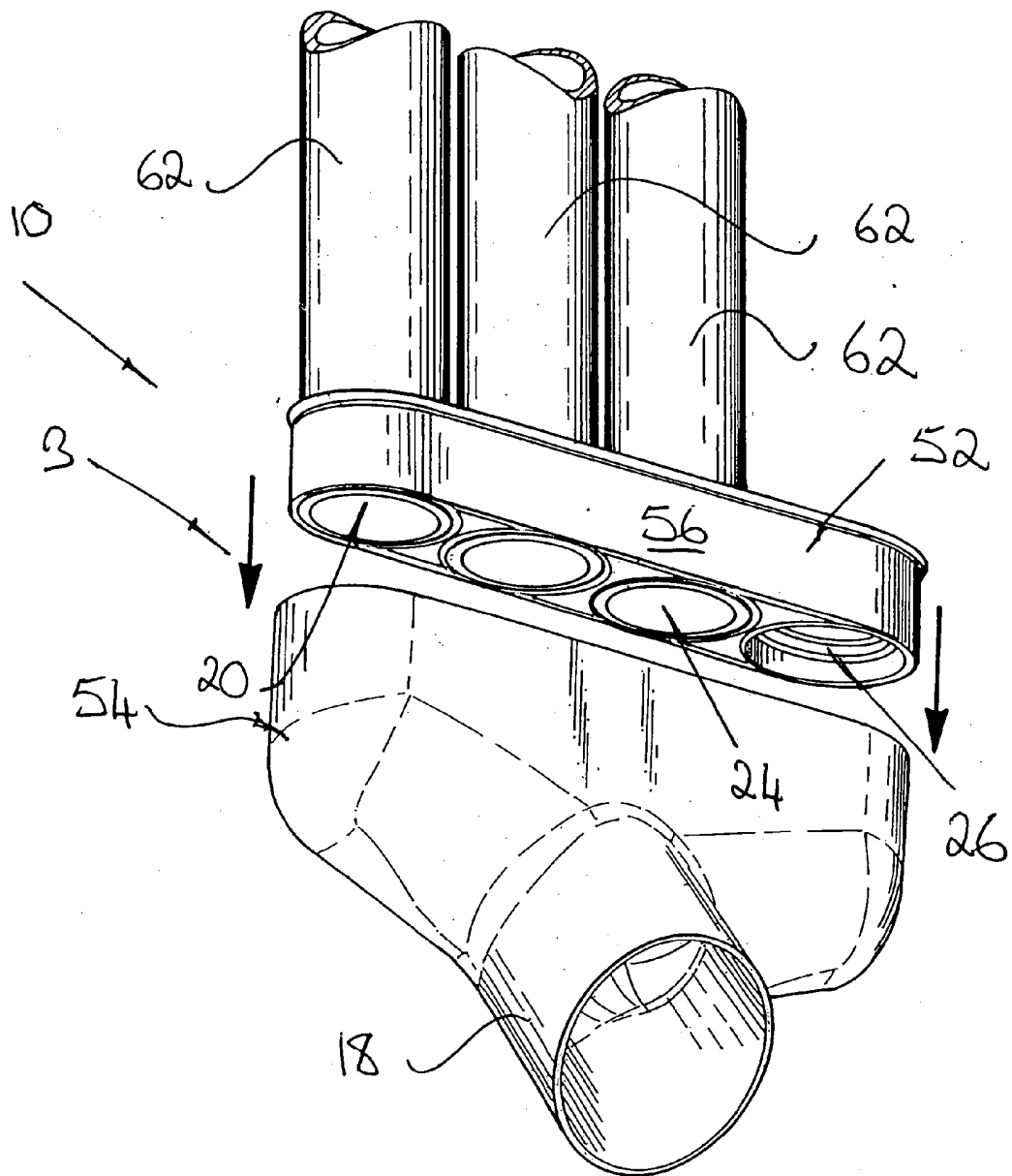


Fig 11

A PIPE FITTING**FIELD OF THE INVENTION**

5 This invention relates to a pipe fitting. This invention also extends to a pipeline installation including the pipe fitting. The invention also extends to a method of coupling pipes to each other.

10 This invention relates particularly but not exclusively to a multi pipe fitting that can couple two or more parallel pipes to a single pipe to effect either convergent or divergent flow through the pipes. It will therefore be convenient to hereinafter describe the invention with reference to this example application. At the same time however it is to be clearly understood that the invention is capable of broader application.

15

BACKGROUND TO THE INVENTION

Very often in plumbing applications it is desired to merge two or more upstream pipes into a single downstream pipe. This typically might occur in drainage
20 where drain pipes from a number of water utilizing contrivances are progressively merged to yield a single pipe that drains waste water away from a site such as a domestic dwelling. Further it is also common to desire to diverge one pipe into two or more pipes. Typically this might occur when mains water is supplied to a site through a single supply pipe and this pipe needs to diverge
25 into two or more water supply pipes carrying water to specific water utilizing contrivances

These plumbing connections often take time to assemble and fit. This imposes an expense. Further it may also require a skilled plumber to do the work
30 properly. This can also impose additional expense. Further it is also desirable that a reliable plumbing connection is formed that resists water leakage in subsequent use.

Clearly it would be advantageous of a pipe fitting could be devised that at least partially helped to meet these objectives.

5 SUMMARY OF THE INVENTION

According to one aspect of this invention there is provided a pipe fitting which includes:

10 a fitting body defining a flow passage there through having one end and another end;

at least one pipe coupling arrangement towards said one end of the flow passage for coupling to a pipe; and

15 at least two other pipe coupling arrangements spaced from said one end of the flow passage for coupling to at least two other pipes respectively, at least one of said other pipe coupling arrangements including a pipe coupling formation that is closed off by a blank wall that can be opened optionally to
20 prepare the coupling formation for coupling the pipe coupling formation to a pipe.

The at least one pipe coupling arrangement may be mounted in or on the body. Further at least two other pipe coupling arrangements may be mounted in or on
25 the body.

Each one of said other pipe coupling arrangements, i.e. all of said at least two other pipe coupling arrangements, spaced from said one end of the flow passage may include a pipe coupling formation that is closed off by a blank wall
30 that can be opened optionally or selectively to prepare the pipe coupling formation for coupling to a pipe.

At least one of said other pipe coupling arrangements may include a gang of at least two pipe coupling formations that are closed off with a common blank wall. An associated part of the common blank wall can be opened optionally to prepare a selected one of the two pipe coupling formations for coupling to a pipe.

Each one of said other pipe coupling arrangements spaced from said one end of the flow passage may include a gang of pipe coupling formations that are closed off with a common blank wall. Again an associated part of the blank wall can be opened optionally or selectively to prepare a selected one of the two pipe coupling formations for coupling to a pipe.

The pipe coupling formations of each gang of pipe coupling formations may increase successively in coupling size. Further the pipe coupling formations may be arranged in a nesting relationship in order of increasing coupling size. Thus the pipe coupling formations in each gang are arranged such that each pipe coupling formation is received within the next larger pipe coupling formation except for the largest pipe coupling formation which surrounds and receives all the other pipe coupling formations.

The pipe coupling formations in each gang of coupling formations may be selected from a group comprising socket and nipples (or spigots). Further the pipe coupling formations may be arranged concentrically with each other.

Each gang of pipe coupling formations may have three sockets, each socket being sized to receive an end region of a standard size of pipe by means of an interference fit for fitment or coupling of the pipe to the fitting. The sockets defined by the pipe coupling formations may taper inwardly, e.g. slightly, in an axial direction, to enhance and promote the interference fit.

Each gang of pipe coupling formations may have three pipe coupling formations that are concentrically arranged relative to each other. These three sizes of concentric pipe coupling formations may be sized for coupling to certain well known and wisely used pipe sizes. For example the pipe coupling formations
5 may be sized for coupling to pipe sizes having a nominal diameter of 40mm, 50mm and 65mm.

The pipe fitting may further include a locating marker for locating a position of a cutting tool for cutting away at least part of the blank wall to prepare the pipe
10 coupling formation.

The locating marker may be positioned on the blank wall and conveniently may be formed by a locating tab on which a centering piece of a cutting tool can be located.
15

Each pipe coupling formation in a gang may have a coupling end opposite another end. The pipe coupling formations may be arranged with their coupling ends coplanar with each other. Each pipe coupling formation may have an axial length that is at least 0.35 of the diameter of that pipe coupling formation. In
20 particular each pipe coupling formation may have an axial length that is 0.40 to 0.60 of the diameter of that pipe coupling formation. This ensures that there is sufficient contact surface area of pipe to the coupling formation.

The blank wall of each gang of pipe coupling formations may extend across said coplanar coupling ends of the coupling formations in the gang. Further the
25 blank walls of each of the different gangs of pipe coupling formations may be broadly coplanar with each other.

The blank walls of each of the different gangs of pipe coupling formations may
30 merge with each other to form a major blank wall. Thus the discrete blank walls of each gang together merge to form a major blank wall for all the gangs.

All of said other pipe coupling arrangements may be received within the body and may be positioned adjacent said other end of the body.

5 The fitting body may have a body end wall at said other end of the flow passage, and said gangs of other pipe coupling arrangements may be mounted on said body end wall. Said body end wall may be substantially planar and said body end wall may form said major blank wall closing off said gangs of pipe coupling formations.

10 The pipe fitting which includes at least two other pipe coupling arrangements may have two to four said other pipe coupling arrangements on the fitting body. Said two to four other pipe coupling arrangements may be laterally spaced apart from each other on the fitting body.

15 The major blank wall may be elongate, and said other pipe coupling arrangements may be arranged in single file lengthwise on the elongate blank wall.

20 Each said one coupling arrangement may include a pipe coupling formation on the fitting body for coupling to an end region of a pipe.

25 The pipe fitting may include only one said one pipe coupling arrangement, and this one pipe coupling arrangement may be positioned adjacent said one end of the flow passage. Further this one pipe coupling arrangement may be sized for coupling to a standard size of pipe. The one coupling arrangement maybe in the form of a spigot (or nipple) or a socket sized for coupling to a standard pipe size.

30 The fitting body may comprise a first body part and a second body part. The first body part may include an engagement formation and the second body part may include a complementary engagement formation for engaging said one

engagement formation whereby to mount the second body part to said one body part and connect them to each other.

5 The one engagement formation may include a perimeter wall extending around a peripheral edge region of said first body part, and a peripheral edge of said second body part may be shaped and sized to be received within said perimeter wall with an interference fit.

10 The first body part may further include a perimeter flange extending out from the perimeter wall on said first body part for locating the second body part when it is fully engaged with said first body part.

Said other pipe coupling arrangements may be mounted on the first body part. Said one coupling arrangement may be mounted on said second body part.
15

The first body part and the other pipe coupling arrangements may be integrally formed. The first body part and the other pipe coupling arrangements may be integrally formed of a polymeric material by a moulding operation, e.g. an injection moulding operation.
20

Further the second body part and said one coupling arrangement are integrally formed. The second body part and said one pipe coupling arrangement may be integrally formed of a polymeric material by a moulding operation, e.g. an injection moulding operation.
25

According to another aspect of this invention there is provided a pipe installation comprising:

30 a pipe fitting as described above according to the first aspect of the invention having at least one pipe coupling towards said one end of a flow passage and at least two other pipe coupling arrangements spaced from said one end of the flow passage; and

at least one pipe for that is operatively coupled to said one pipe coupling;
and

5 at least two other pipes coupled to said at least two other pipe coupling
arrangements.

The pipe fitting may include any one or more of the optional features of the pipe
fitting described above according to the first aspect of the invention.

10 Each of the pipes may be of circular cylindrical configuration with a circular
cross-section. Further each of the pipes may be of plastic. Further the pipes
may be permanently fixed and sealed to each other, e.g. using solvent welding,
adhesive, sealant and the like.

15 According to another aspect of this invention there is provided a method of
merging a plurality of pipes into a single pipe, the method comprising:

20 providing a pipe fitting as defined above in the first aspect of the
invention having at least one pipe coupling towards said one end of a flow
passage and at least two other pipe coupling arrangements spaced from said
one end of the flow passage;

25 providing a single pipe for coupling to said at least one pipe coupling;
providing at least two other pipes for coupling to said at least two other pipe
coupling arrangements spaced from said one end of the flow passage;

cutting the blank wall on the pipe fitting to open it up and facilitate
coupling of the other pipes with the associated pipe coupling arrangements;

30 operatively coupling each of said other pipes to said other pipe coupling
arrangements; and

operatively coupling said single pipe to said one pipe coupling arrangement.

- 5 The method may include cutting the various pipes to length, e.g. before they are operatively coupled to the pipe fitting.

The method may also include sealing the pipes to the pipe fitting and permanently attaching the pipes to the pipe fitting

10

The pipe fitting may include any one or more of the optional features of the pipe fitting described above according to the first aspect of the invention.

DETAILED DESCRIPTION OF THE INVENTION

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A pipe fitting in accordance with this invention may manifest itself in a variety of forms. It will be convenient to hereinafter describe several embodiments of the invention in detail with reference to the accompanying drawings. The purpose of providing this detailed description is to instruct persons having an interest in the subject matter of the invention how to carry the invention into practical effect. However it is to be clearly understood that the specific nature of this detailed description does not supersede the generality of the preceding broad description. In the drawings:

20

- 25 Fig. 1 is an exploded three dimensional view of a pipe fitting comprising first and second body parts in accordance with a first embodiment of the invention;

Fig. 2 is an assembled three dimensional view of the pipe fitting of Fig. 1;

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Fig. 3 is a three dimensional view of the first body part for the pipe fitting of Fig. 1;

Fig. 4 is a top plan view of the first body part shown in Fig. 3;

Fig. 5 is a bottom plan view of the first body part shown in Fig. 4;

5

Fig. 6 is a bottom plan view of the second body part for the pipe fitting of Fig. 1;

10

Fig. 7 is a top plan view of the second body part shown in Fig. 6;

Fig. 8 is a front view of the second body part shown in Fig. 6;

Fig. 9 is a side view of the second body part shown in Fig. 6;

15

Fig. 10 is a three dimensional view showing an initial stage in the coupling of pipe sections to the pipe fitting;

Fig. 11 is a three dimensional view showing a subsequent stage in the coupling of pipe sections to the pipe fitting;

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Fig. 12 is a three dimensional view showing a yet later stage in the coupling of pipe sections to the pipe fitting;

Fig. 13 is a three dimensional view showing the assembled pipe fitting and pipe sections;

25

Fig. 14 is a part sectional front view showing of a different embodiment showing the coupling of three pipe sections to the pipe fitting of Fig. 1;

30

Fig. 15 is a schematic three dimensional view showing the pipe fitting of Fig. 1 in use coupled up to various pipes in a bathroom of a domestic dwelling;

Fig. 16 is a three dimensional view of a first body part for a pipe fitting in accordance with another embodiment of the invention;

Fig. 17 is a top plan view of the first body part shown in Fig. 16;

Fig. 18 is a bottom plan view of the first body part shown in Fig. 16;

Fig. 19 is a three dimensional view of a first body part for a pipe fitting in accordance with another embodiment of the invention;

Fig. 20 is a top plan view of the first body part shown in Fig. 19; and

Fig. 21 is a bottom plan view of the first body part shown in Fig. 19.

In Figs. 1 to 9 reference numeral 10 refers generally to a pipe fitting in accordance with the invention.

The pipe fitting 10 comprise broadly a fitting body 12 having a flow passage 13 there through having one end 14 and another end 16. The fitting 10 also includes one pipe coupling arrangement 18 on the body 12 towards the end 14 of the flow passage for coupling to a pipe. The fitting 10 also includes four other pipe coupling arrangements received within the body 12 adjacent the end 16 of the body 12 for coupling to further pipes.

Each of the other pipe coupling arrangements comprises a gang of pipe coupling formations indicated generally in the drawings by reference numerals 20, 22, 24 and 26. In the illustrated embodiment each gang of pipe coupling formations comprises three pipe coupling formations 30, 32 and 34. The three pipe coupling formations 30, 32 and 34 are tubular and are arranged with each tubular coupling formation received within the next larger coupling formation except for the largest coupling formation.

In the illustrated form the tubular coupling formations 30, 32 and 34 in each gang are arranged concentrically with each other and have a common centre. Further each pipe coupling formation is in the form of a socket that is sized to receive an end region of a standard size pipe therein with an interference fit.

5

In other forms that have not been illustrated each pipe coupling formation is in the form of a nipple or spigot that is received within an open end region of a pipe.

10 Further each gang of pipe coupling arrangements 20, 22, 24, 26 is closed off by a blank wall 38 common to the coupling formations in that arrangement. In use as will be described in more detail below each blank wall 38 can be selectively opened up to permit an end region of a pipe to be engaged with the respective pipe coupling formation to couple the pipe to the formation.

15

The pipe fitting 10 further includes a locating marker 40 for each gang 20, 22, 24, and 26 for locating a position of the cutting tool for cutting away at least part of the blank wall 38. In the illustrated form each locating marker 40 comprises tabs on the blank wall 38 positioned centrally with respect to the concentric pipe coupling formations.

20

As described above each gang of tubular coupling formations 20, 22, 24, 26 has three said concentrically arranged coupling formations. Each tubular coupling formation has one end which is a coupling end 42 and another end 44 and the coupling ends 42 are broadly co-planar with each other. That is they are laterally aligned with each other. The blank wall 38 of each gang of coupling formations extends across the one ends 42 of the coupling formations that are co-planar with each other.

25

30 In the illustrated embodiment the four gangs of pipe coupling formations 20, 22, 24, 26 are broadly co-planar with each other and the blank walls 38 of the

gangs merge with each other to form a major blank wall shown generally by the numeral 50.

5 The fitting body 12 comprises a first body portion 52 and a second body portion 54.

10 The first body portion 52 includes a body end wall at said other end that is substantially planar. Conveniently in the illustrated embodiment the end wall forms the major blank wall 50 for the gangs 20, 22, 24, 26 of pipe coupling formations.

15 In the illustrated embodiment the body end wall 50 is elongate and the four gangs of pipe coupling formations 20, 22, 24, 26 are arranged spaced apart from each other along the longitudinal length of the end wall 50. Thus the four gangs of pipe coupling formations are positioned on the same end of the flow passage 13 and the same end 16 of the body 12. Further the pipe coupling formations 30, 32 and 34 within all of the four gangs 20, 22, 24, 26 all face in the same direction.

20 The first body part 52 also includes a perimeter wall 56 extending around a peripheral edge region of said first body part 52. The first body part 52 also includes a perimeter flange 58 extending transversely away from the perimeter wall 56 for locating the second body 54 part thereon as will be described in more detail below.

25 The second body portion 54 has said one pipe coupling arrangement 18 mounted thereon. The second body portion 54 has an open end 60 that is configured and sized to form the complementary engagement formation for engaging said one engagement formation in the form of flange 58 to mount the
30 second body part 54 on the first body part 52.

The pipe coupling formation 18 at the end of the flow passage 13 in the illustrated embodiment comprises a socket that is sized to receive an end region of a standard sized pipe to couple it there to. The socket 18 is integrally formed with the second body part 54 and projects outwardly away from the second body part 54.

The first body part 52 may be formed as an integral article in an injection moulding operation. Further the pipe coupling arrangements 20, 22, 24 and 26 may be formed integrally with the first body part 52 as may the major blank wall 50 by injection moulding. The parts are moulded of plastics material.

The second body part 52 may also be formed integrally by an injection moulding operation. Further the pipe coupling arrangement 18 may also be formed integrally with the second body part by injection moulding. By utilizing injection moulding in this fashion the number of moulding steps required to manufacture the fitting 10 can be reduced and the cost of manufacturing the fitting can be contained.

In use the pipe fitting 10 is used to couple multiple pipes 62 in parallel to a single pipe 64. This can be done to direct flow to converge from more than one pipe 62 upstream of the fitting 10 into a single downstream pipe 64. It can also be used to cause flow to diverge from a single pipe 64 upstream of the fitting 10 into more than one pipe 62 downstream of the fitting 10.

An example use of the pipe fitting 10 is illustrated in Figs. 10 to 14.

In Fig. 10 the first body part 52 having the major blank wall 50 and the gangs of pipe fitting formations 20, 22, 24, 26 are prepared for use by removing part of the blank wall 50 to expose the appropriate sized socket formation 30, 32, and 34 for coupling to the size of pipe 62 to which it is to be coupled.

If the pipe 62 to be coupled to the coupling arrangement associated 20, 22, 24, or 26 is sized to be received within the smallest socket 30 then the part of the blank wall 38 inward of the smallest socket 30 is removed. The nature of the cut that is made in the blank wall and the amount of material that is removed to expose this socket is shown in Fig. 14. This pipe coupling is shown on the middle pipe coupling on the fitting in Fig. 14. The pipe 62 can then be passed through the blank wall 38 and into the socket 30.

If the pipe 62 to be coupled to a particular coupling arrangement 20, 22, 24, or 26 corresponds to the largest socket 34 then the part of the blank wall 48 that is radially inward of the largest socket 34 together with the two smaller sockets 30 and 32 mounted on this part of the blank wall 38 are removed from the wall 38. This then opens up unimpeded access to the largest socket 34 and permits a correspondingly sized pipe 62 to be inserted therein. The nature of the cut that is made in the blank wall and the amount of material that is removed to expose this socket is shown on the left pipe coupling in Fig. 14.

A similar procedure is followed if the pipe 62 to be coupled corresponds to the middle sized socket 32. This pipe coupling is shown on the right side of the fitting 10 in Fig. 14.

Fig. 10 shows the first body part 52 on a work surface with two appropriately sized holes having been cut in the major blank wall 50 and a third hole in the process of being cut with a hole saw. As is shown the centre piece of the saw can be mounted on the tab to correctly centre the saw on the major blank wall 50.

Once this has been done the pipes 62 to be coupled are inserted into the corresponding sockets and adhered to the wall of the socket using adhesive, sealant or solvent welding or the like. This seals the end regions of the pipes 62 to the sockets and permanently mounts the pipes 62 to the sockets.

Once this has been done the pipe fitting 10 is ready to be assembled by mounting the first body part 52 and associated pipes 62 on the second body part 54. As shown in Fig. 11 this is accomplished by mounting the open end 60 of the second body part 54 over the perimeter wall 56 of the first body part 52.

- 5 The two body parts 52, 54 are then permanently mounted to each other and sealed to each other using sealant, solvent welding or the like.

Thereafter another pipe 64 is mounted on said one pipe coupling formation 18 on the second part 54 by inserting an end region of the pipe into the socket 18 as shown in Fig. 12. The pipe end region is sealed to the body part 54 in the same manner as described above for the pipes 62.

The fully assembled assembly of pipes 52, 54 and pipe fitting 10 is shown in Fig. 13.

15

Fig. 14 shows an example attachment of a plurality of pipes to the pipe fitting 10 illustrated in the earlier drawings.

In particular this drawing shows how much material is removed from the blank wall 50 to provide each of the different sized sockets in each gang of pipe coupling formations. It also shows the considerable extent of surface area of each socket that makes sealing and adhering contact with the respective pipes 62.

- 25 Fig. 15 shows an example application of the pipe fitting to a bathroom in a dwelling.

In this application four different pipes 62 that are water drainage pipes are directed away from wastes associated with baths, sinks, basins, floors and showers.

30

These pipes 62 are each operatively coupled to a said pipe coupling arrangement on the end wall 50 of the pipe fitting 10 of Fig. 1 in the manner shown. A single drainage pipe 64 is coupled to the coupling formation 18 on the second body part 54 and this drains water out of the bathroom and into a single drainage main.

The pipe fitting 10 achieves the coupling of four parallel pipes 62 into a single drain pipe 64 in a very compact and space efficient manner. The pipe fitting 10 can be fitted into a small space such as in a small bathroom cupboard or the like.

Further the coupling of the pipes to the pipe fitting can be accomplished very quickly and efficiently and requires minimal skill on the part of the person doing the plumbing work. All they need to do is to cut the correct size of hole in the blank wall 50 to open up the correct size of coupling formation and cut the various pipes to the correct length. The pipes are then inserted into the pipe coupling formations and solvent welded there to completing the assembly of the plumbing installation.

Figs. 16 to 18 illustrate a first body part for a pipe coupling in accordance with a second embodiment of the invention.

As this embodiment has structural and functional similarities with the first embodiment described above the same reference numerals will be used to refer to the same components unless otherwise illustrated.

The major difference between this embodiment and the first embodiment is that it only has two gangs of pipe coupling formations 22, 24 on the end wall 50 of the first body part 52 instead of four. As such it is only capable of attachment to two pipes 62 in parallel. It will therefore typically be used in applications where a maximum of two pipes are required to be converged into a single pipe. In such applications particularly where space is limited this embodiment may be

very useful because it is more compact and occupies less space than the first embodiment.

5 Figs. 19 to 21 illustrate a first body part for a pipe coupling in accordance with a third embodiment of the invention.

10 As this embodiment has structural and functional similarities with the first embodiment described above the same reference numerals will be used to refer to the same components unless otherwise illustrated.

15 The major difference between this embodiment and the first embodiment is that it only has three gangs of pipe coupling formations 22, 24, 26 on the end wall 50 of the first body part 52 instead of four. As such it is only capable of attachment to three pipes 62 in parallel. It will therefore typically be used in applications where two or three pipes are required to be converged into a single pipe. In such applications particularly where space is limited this embodiment may be useful.

20 An advantage of the pipe fitting described above with reference to the drawings is that it simplifies the task of merging a plurality of pipes into a single pipe or conversely diverge a single pipe into a plurality of pipes. It reduces the task to measuring and cutting pipes and then cutting a few holes in a blank wall with a hole saw. Further the fitting even has a locating marker in it to centre the hole saw in the correct position relative to the pipe coupling formations hidden behind the blank wall.

25 A further advantage of the pipe fitting described above is that each pipe coupling arrangement is capable of being coupled to three different sizes of pipes by simply varying the cut through the blank wall. This makes the fitting very versatile.

A further advantage is that the fitting is very compact in the longitudinal direction of the tubular sockets. They surround each other and do not need to be staggered in a longitudinal direction. A further advantage is that the fitting can be manufactured by injection moulding in only two moulding operations. This
5 helps to simplify and lower the cost of manufacturing.

It will of course be realized that the above has been given only by way of illustrative example of the invention and that all such modifications and variations thereto, as would be apparent to persons skilled in the art, are
10 deemed to fall within the broad scope and ambit of the invention as is herein set forth.

THE CLAIMS DEFINING THE INVENTION ARE AS FOLLOWS:

1. A pipe fitting which includes:

5 a fitting body defining a flow passage there through having one end and another end;

at least one pipe coupling arrangement towards said one end of the flow passage for coupling to a pipe; and

10

at least two other pipe coupling arrangements spaced from said one end of the flow passage for coupling to at least two other pipes respectively, at least one of said other pipe coupling arrangements including a pipe coupling formation that is closed off by a blank wall that can be opened optionally to prepare the coupling formation for coupling the pipe coupling formation to a pipe.

15

2. A pipe fitting as claimed in claim 1, in which each one of said other pipe coupling arrangements spaced from said one end of the flow passage includes a pipe coupling formation that is closed off by a blank wall that can be opened optionally to prepare the pipe coupling formation for coupling to a pipe.

20

3. A pipe fitting as claimed in claim 1, in which at least one of said other pipe coupling arrangements includes a gang of at least two pipe coupling formations that are closed off with a common blank wall of which an associated part can be opened optionally to prepare a selected one of the two pipe coupling formations for coupling to a pipe.

25

4. A pipe fitting as claimed in claim 3, in which each one of said other pipe coupling arrangements spaced from said one end of the flow passage includes a gang of pipe coupling formations that are closed off with a common blank wall

30

of which an associated part can be opened optionally to prepare a selected one of the two pipe coupling formations for coupling to a pipe.

5. A pipe fitting as claimed in claim 3 or claim 4, in which the pipe coupling
5 formations of each gang of pipe coupling formations increase successively in coupling size, and in which the pipe coupling formations are arranged in a nesting relationship in order of coupling size.

6. A pipe fitting as claimed in any one of claims 3 to 5, in which the pipe
10 coupling formations in each gang of coupling formations are selected from a group comprising socket and nipples, and in which the pipe coupling formations is arranged concentrically with each other.

7. A pipe fitting as claimed in claim any one of claims 3 to 6, wherein each
15 gang of pipe coupling formations has three pipe coupling formations that are concentrically arranged relative to each other.

8. A pipe fitting as claimed in claim 7, wherein each gang of pipe coupling
20 formations has three sockets, each socket being sized to receive an end region of a standard size of pipe by means of an interference fit for fitment of the pipe to the fitting.

9. A pipe fitting as claimed in any one of claims 3 to 8, further including a
25 locating marker for locating a position of a cutting tool for cutting away at least part of the blank wall to prepare the pipe coupling formation.

10. A pipe fitting as claimed in claim 9, wherein the locating marker is
positioned on the blank wall and is formed by a locating tab on which a centering piece of a cutting tool can be located.

30

11. A pipe fitting as claimed in any one of claims 3 to 10, wherein each pipe coupling formation in a gang has a coupling end opposite another end, the pipe

coupling formations being arranged with their coupling ends coplanar with each other.

12. A pipe fitting as claimed in claim 11, wherein the blank wall of each gang of pipe coupling formations extends across said coplanar coupling ends of the coupling formations in the gang.

13. A pipe fitting as claimed in claim 12, wherein the blank walls of each of the different gangs of pipe coupling formations are broadly coplanar with each other.

14. A pipe fitting as claimed in claim 13, wherein the blank walls of each of the different gangs of pipe coupling formations merge with each other to form a major blank wall

15

15. A pipe fitting as claimed in any one of claims 3 to 14, wherein all of said other pipe coupling arrangements are received within the body and are positioned adjacent said other end of the flow passage.

16. A pipe fitting as claimed in claim 15, wherein the fitting body has a body end wall at said other end of the flow passage, and said gangs of other pipe coupling arrangements are mounted on said body end wall.

17. A pipe fitting as claimed in claim 16, and said body end wall is substantially planar and said body end wall forms said major blank wall closing off said gangs of pipe coupling formations.

18. A pipe fitting as claimed in any one of claims 1 to 17, including two to four said other pipe coupling arrangements on the fitting body.

30

19. A pipe fitting as claimed in claim 18, wherein said other pipe coupling arrangements are laterally spaced apart from each other on the fitting body.

20. A pipe fitting as claimed in claim 14, wherein the major blank wall is elongate, and said other pipe coupling arrangements are arranged in single file lengthwise on the elongate blank wall.
- 5 21. A pipe fitting as claimed in any one of claims 1 to 20, wherein each said one coupling arrangement includes a pipe coupling formation on the fitting body for coupling to an end region of a pipe.
- 10 22. A pipe fitting as claimed in claim 21, including one said one pipe coupling arrangement, and wherein said one pipe coupling arrangement is positioned adjacent said one end of the flow passage and is sized for coupling to a standard size of pipe.
- 15 23. A pipe fitting as claimed in any one of claims 1 to 22, wherein said fitting body comprises a first body part and a second body part.
- 20 24. A pipe fitting as claimed in claim 23, wherein the first body part includes an engagement formation and the second body part includes a complementary engagement formation for engaging said one engagement formation whereby to mount the second body part to said one body part and connect them to each other.
- 25 25. A pipe fitting as claimed in claim 24, wherein said one engagement formation includes a perimeter wall extending around a peripheral edge region of said first body part, and wherein a peripheral edge of said second body part is shaped and sized to be received within said perimeter wall with an interference fit.
- 30 26. A pipe fitting as claimed in claim 25, wherein the first body part further includes a perimeter flange extending out from the perimeter wall on said first

body part for locating the second body part when it is fully engaged with said first body part.

27. A pipe fitting as claimed in claim 25, wherein said other pipe coupling
5 arrangements are mounted on the first body part.

28. A pipe fitting as claimed in claim 25, wherein said one coupling arrangement is mounted on said second body part.

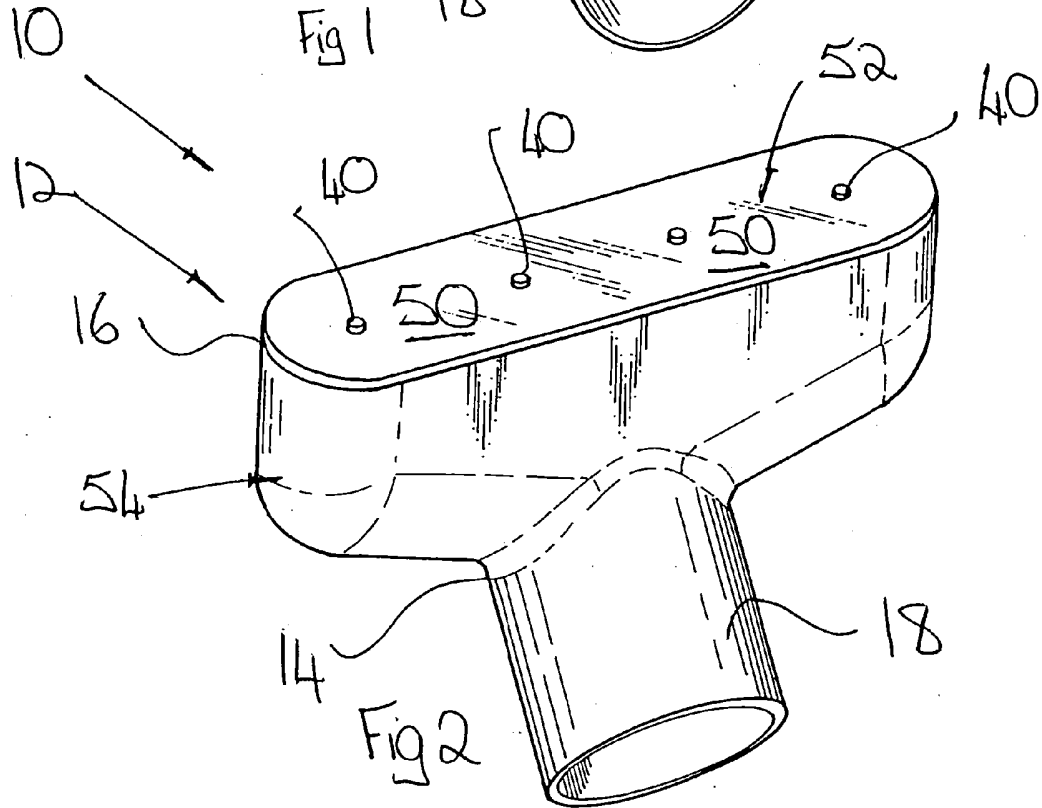
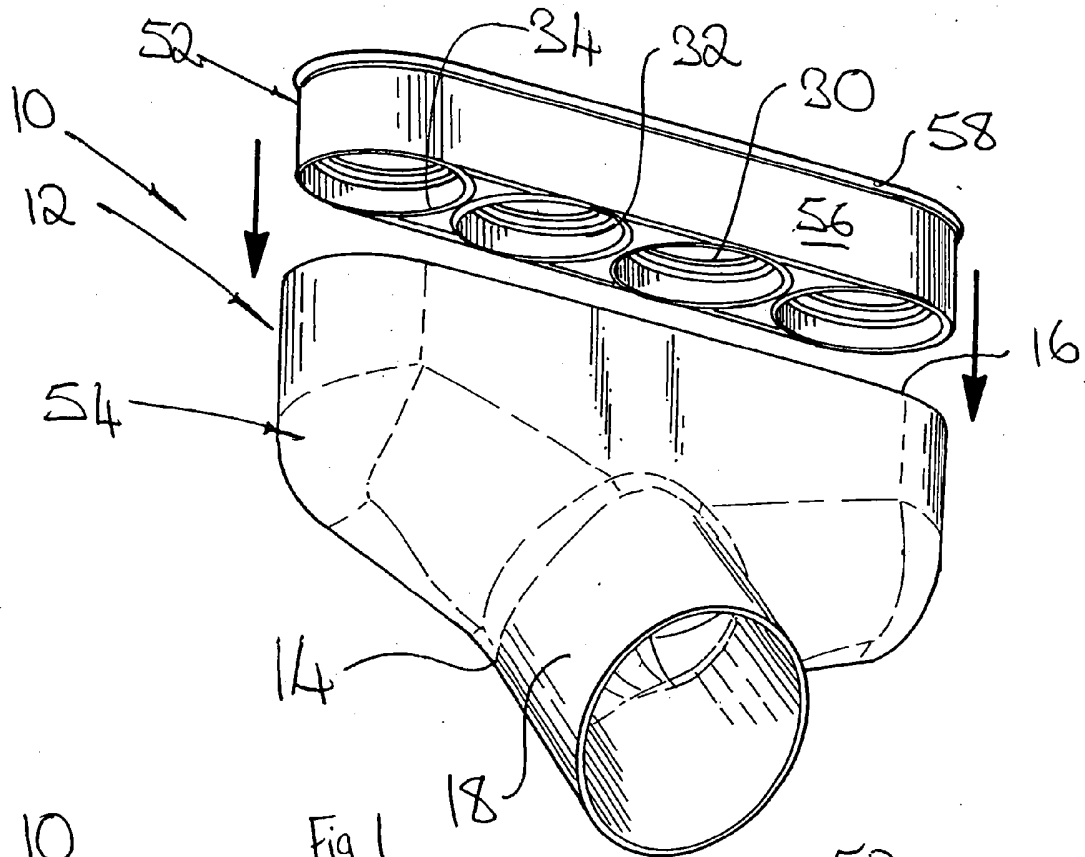
10 29. A pipe fitting as claimed in claim 25, wherein the first body part and the other pipe coupling arrangements are integrally formed.

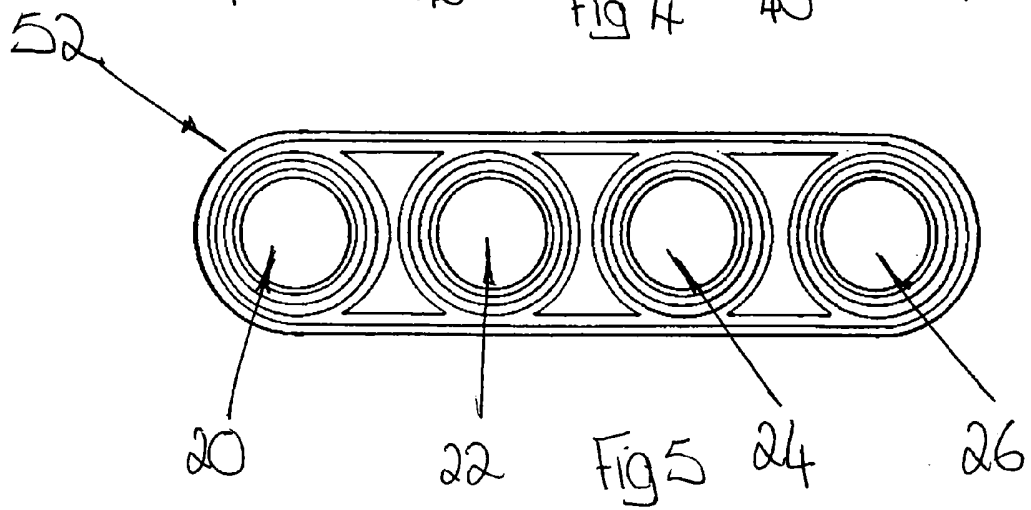
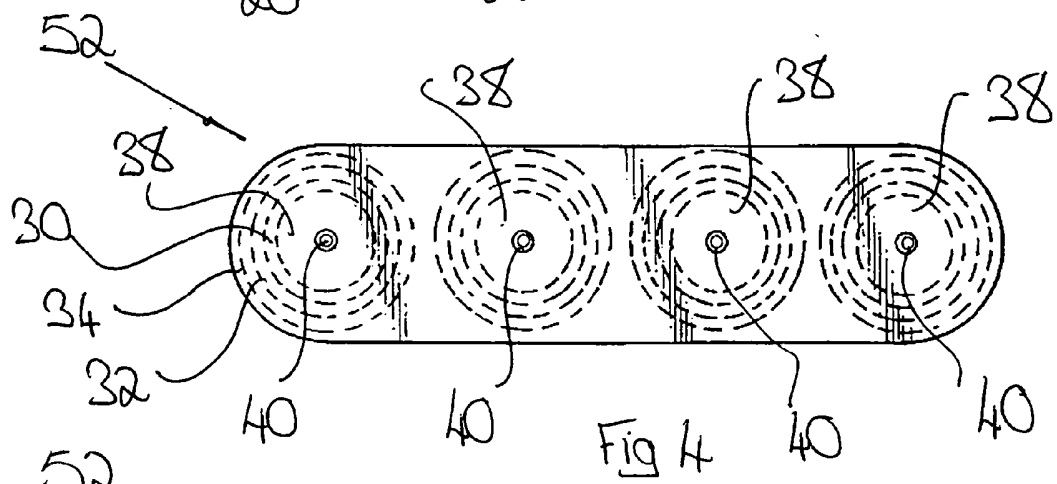
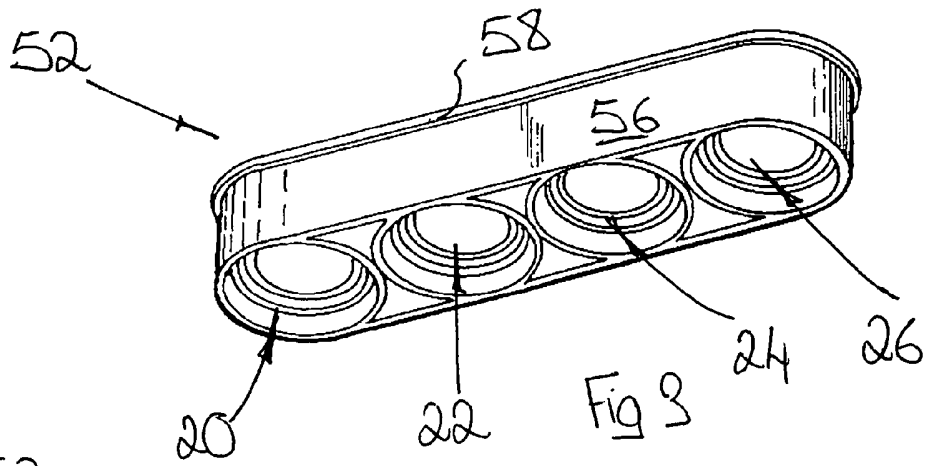
30. A pipe fitting as claimed in claim 25, wherein the first body part and the other pipe coupling arrangements are integrally formed of a polymeric material
15 by a molding operation.

31. A pipe fitting as claimed in claim 25, wherein the second body part and said one coupling arrangement are integrally formed.

20 32. A pipe fitting as claimed in claim 25, wherein the second body part and said one pipe coupling arrangement are integrally formed of a polymeric material by a molding operation.

25 33. A pipe fitting substantially in accordance with any one of the embodiments as herein described in the detailed description with reference to the drawings.





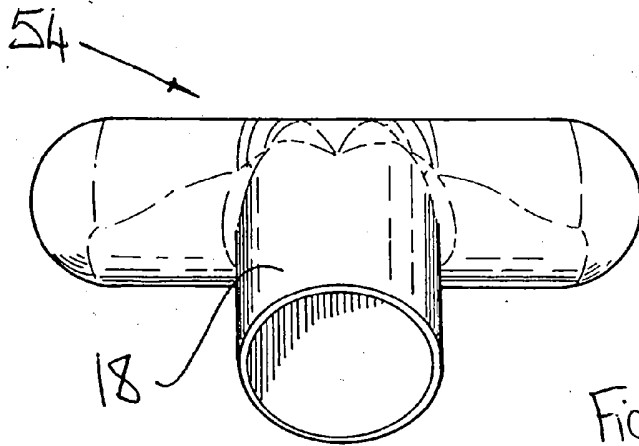


Fig 6

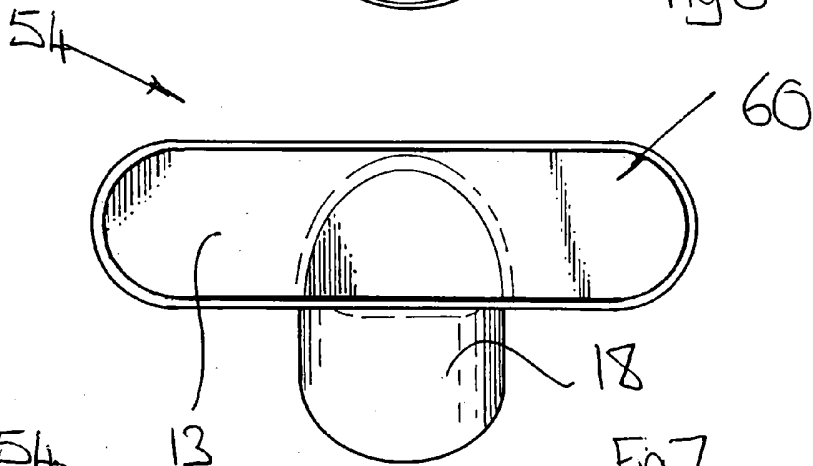


Fig 7

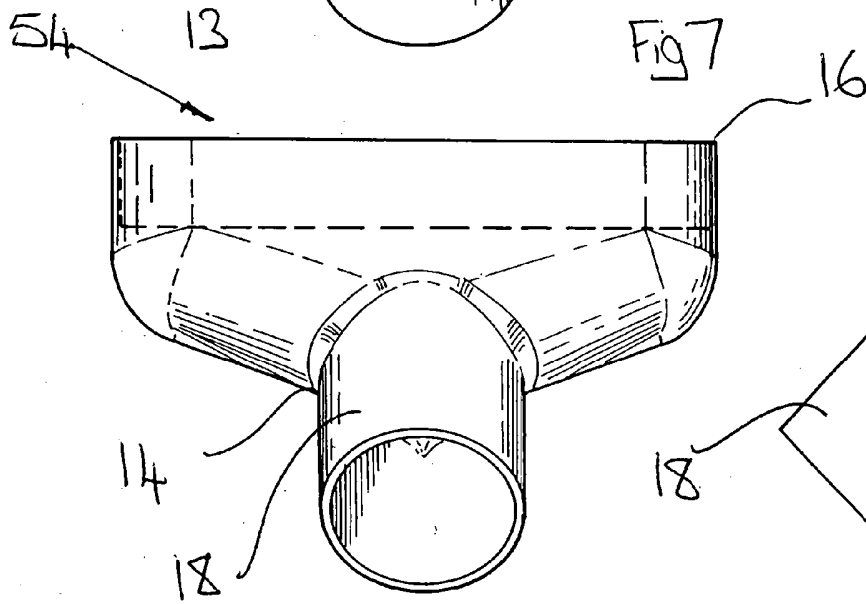


Fig 8

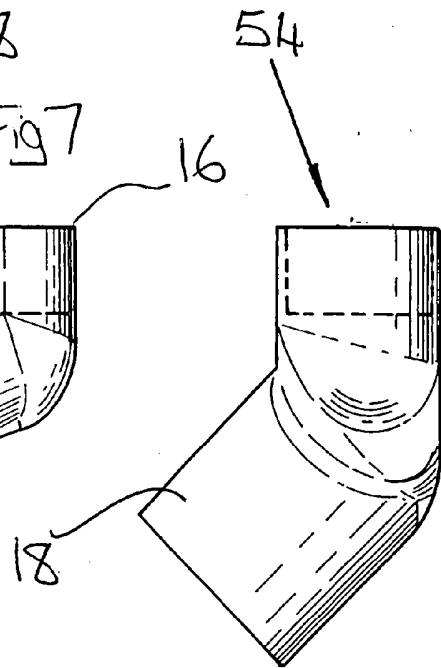


Fig 9

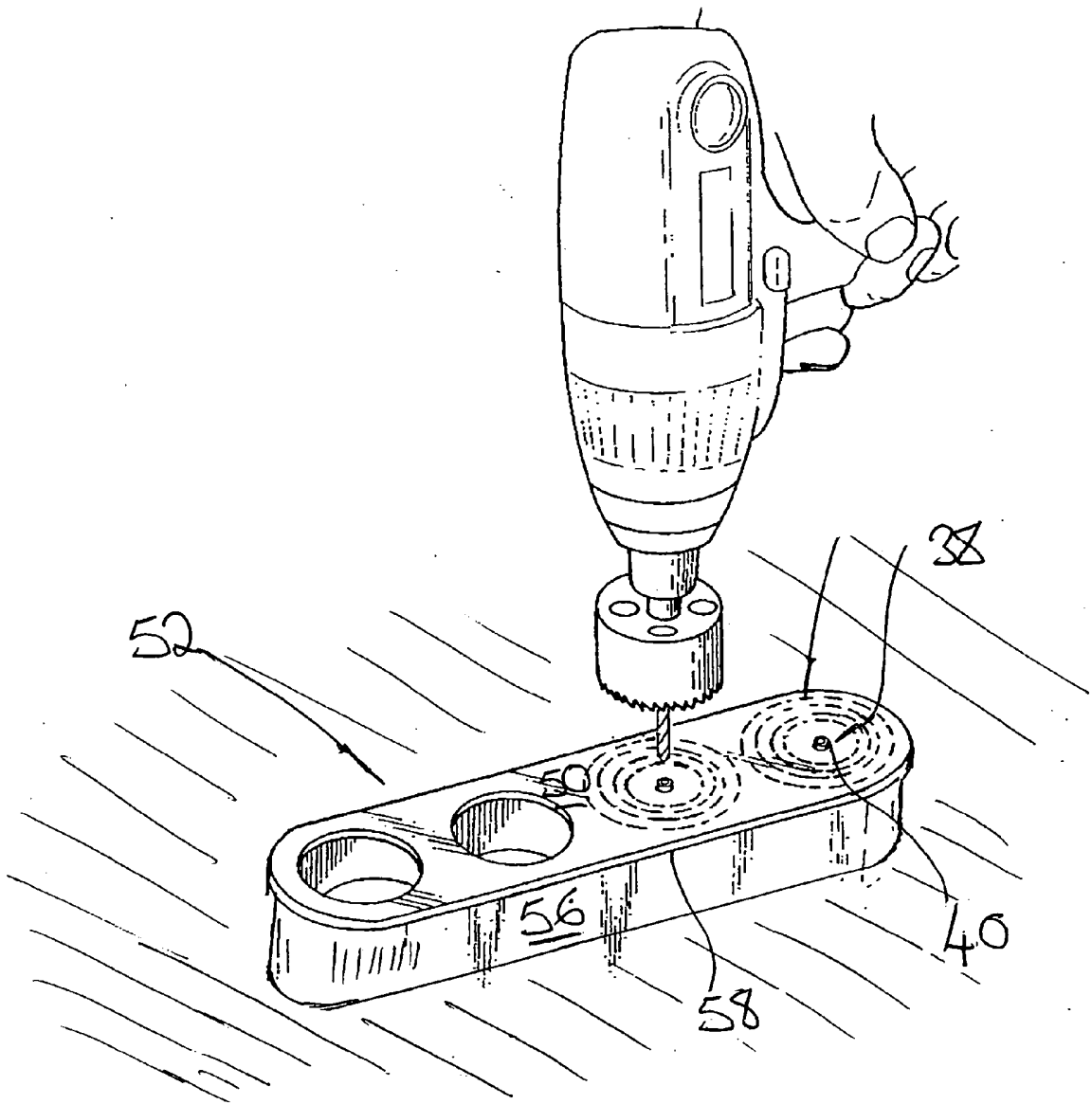


Fig 10

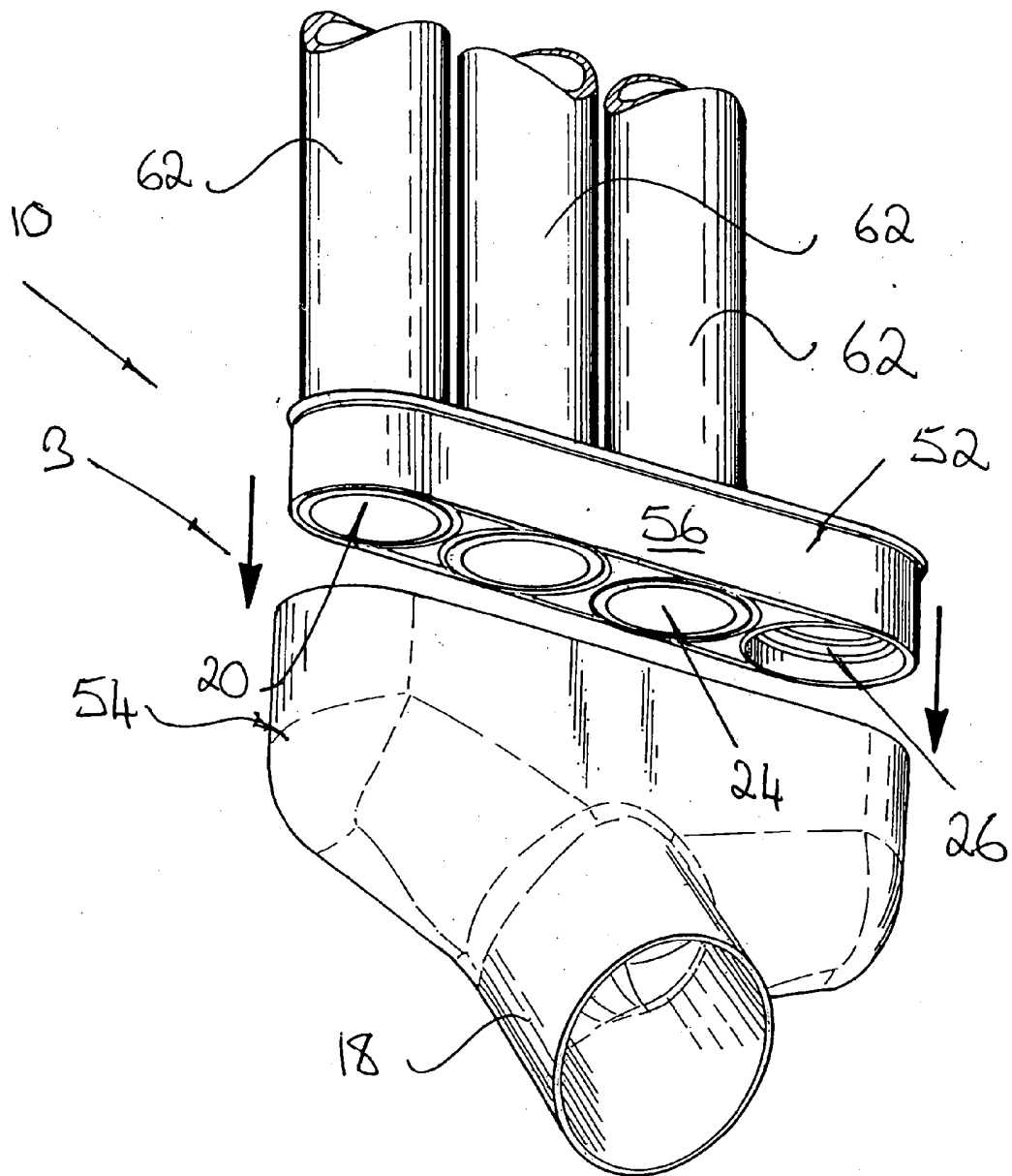
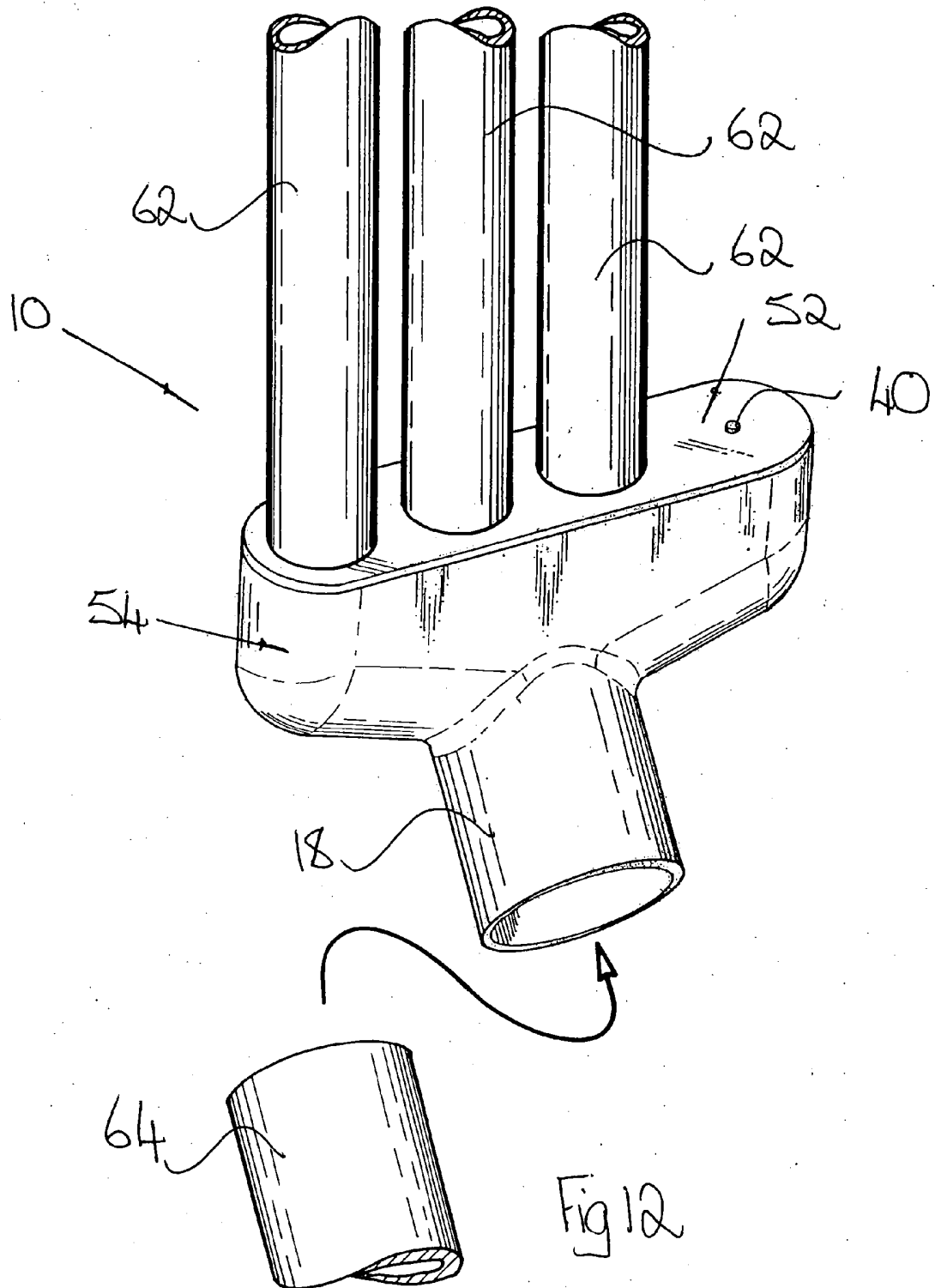
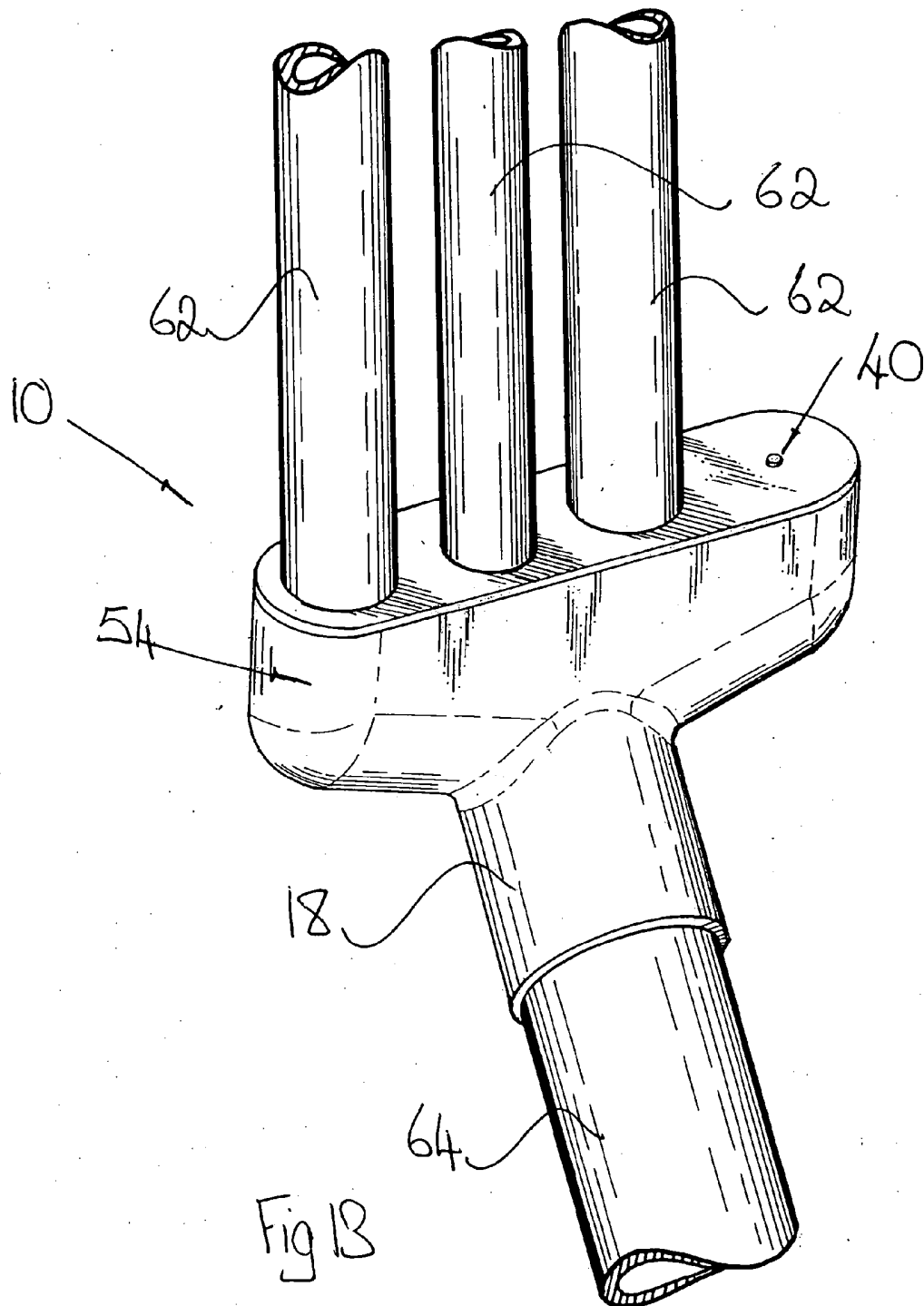


Fig 11





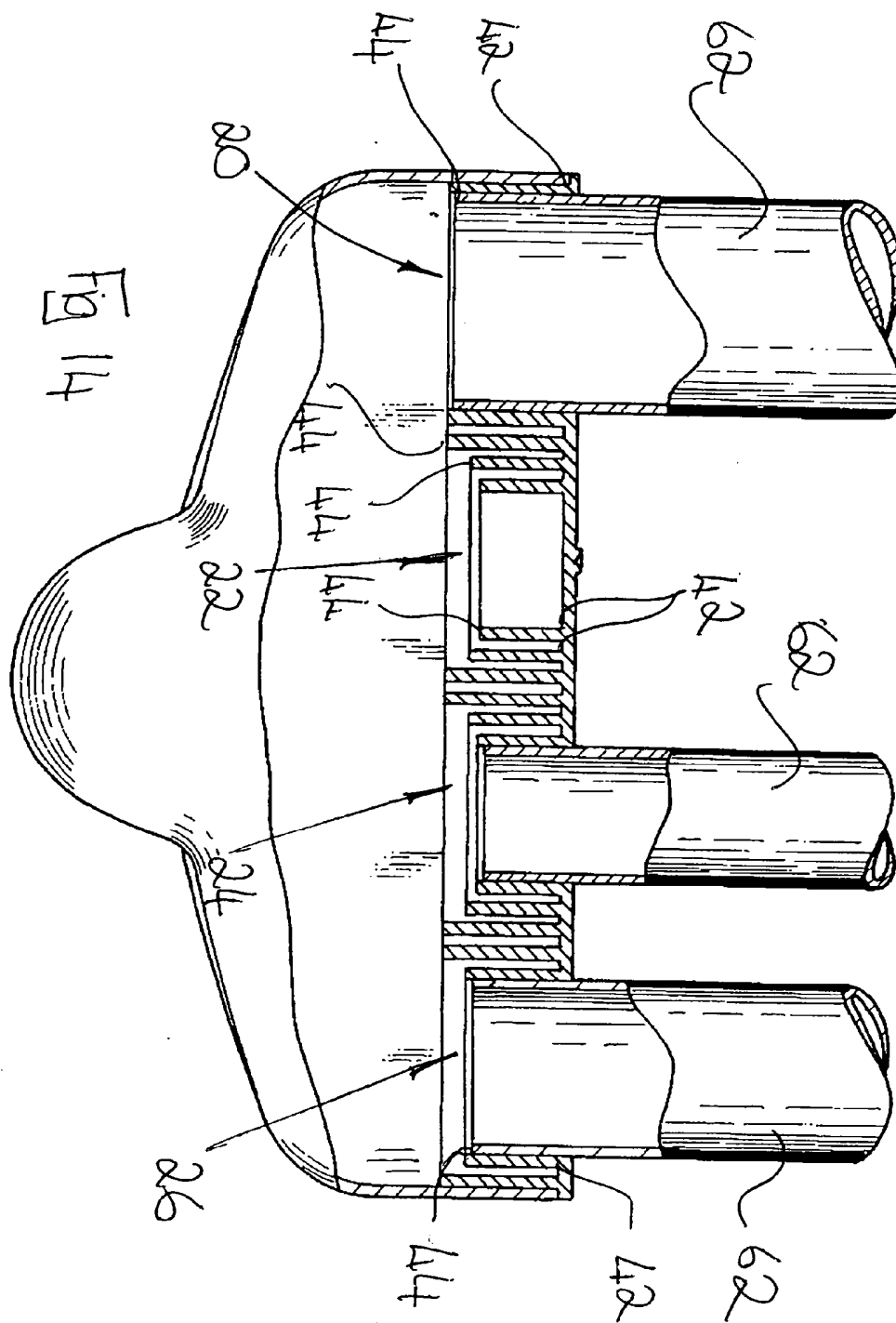


FIG 15

