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(54) **Safety cabinet.**

(57) A safety cabinet which is readily serviceable from either front or rear and has smaller front to rear dimensions than hitherto is constructed with air transfer ducts (60) extending up the two sides of the cabinet. Air flows from fans (44a, 44b) downwards through a filter (26) to the working chamber (24). This air, together with air drawn in through opening (36), then flows via an air space below the working surface and via said side ducts (60) back to an air entry compartment (54) at the top of the cabinet for recirculation through the working chamber (24).

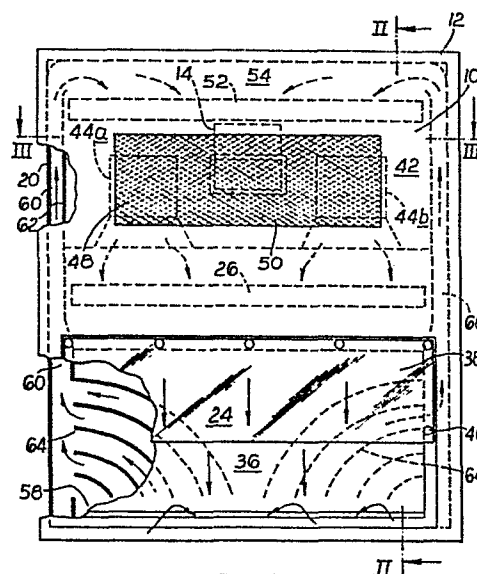


Fig. 1

SAFETY CABINET

This invention concerns a safety cabinet of the kind providing an opening to a working chamber into which a user may introduce his hands for manipulating materials, articles, reagents and the like in said
5 chamber, means being provided for drawing air from the working chamber in such a way as to create a barrier of air at the opening, and for re-circulating the air, after filtration, to the chamber. Such cabinets (hereinafter referred to as "of the kind referred to") are
10 used, for instance, in laboratories, e.g. for microbiological and chemical work.

It is customary in such cabinets to provide, above the working chamber, a fan chamber which houses

a fan and is separated from the working chamber by a main filter. An air entry compartment is disposed above the fan chamber and separated from the latter by an entry filter. An air space below the working
5 chamber and connected with the latter communicates with the air entry compartment by way of an air transfer duct extending up the back of the cabinet, and occupying substantially the entire width thereof.

This customary arrangement has the practical disadvantage that the filters and other components of the
10 cabinet may be serviced only from the front of the cabinet and this can be unacceptable in certain environments, e.g. in pharmacies. Another disadvantage is that the front to rear dimensions of the cabinet can be so
15 large that there can be difficulty in passing the cabinet through laboratory doorways.

An object of the present invention is to provide an improved safety cabinet construction in which these disadvantages are obviated, the cabinet being serviceable
20 either from the front or the back as desired and being capable of being constructed with relatively small front-to-rear dimensions.

With this object in view, the present invention provides a safety cabinet of the kind referred to

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having a fan chamber housing one or more disposed above
a work chamber, an air entry compartment above the fan
chamber and an air space below the working chamber,
characterised by provision of air transfer ducts
5 extending upwards of the two sides of the cabinet so
as to connect the lower air space to the air entry
compartment.

The arrangement is preferably such that at the
rear of the lower part of the working chamber there is
10 a rear exhaust chamber connecting the lower air space
to the air transfer ducts. A plurality of guide
channels preferably extend between the rear exhaust
chamber and the air transfer ducts.

The invention will be described further, by
15 way of example, with reference to the accompanying
drawings, in which:-

Fig. 1 is a front view, with part cut away,
illustrating a practical embodiment of the safety
cabinet of the invention;

20 Fig. 2 is a diagrammatic sectional side elevation,
to a somewhat enlarged scale, taken on the line II-II
of Fig. 1; and

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Fig. 3 is a sectional plan, to an enlarged scale, taken on the line III-III of Fig. 1 and showing the safety cabinet installed in a building.

As shown in the drawings, a preferred embodiment of the safety cabinet of the invention is constructed principally of sheet metal and comprises a housing including a front panel 10 having peripheral fixing flanges 12, rear panels 66, 68, 70 & 72, top and bottom panels 16, 18 respectively, and sidewalls 20, 22 respectively. The lower part of the interior of the housing constitutes a working chamber 24 of the cabinet. The top of the chamber 24 is defined by a main filter 26, preferably a HEPA filter, and the bottom of the chamber 24 is defined by a working surface 28 spaced above the bottom panel 18 of the housing so as to define an air space 30 therebetween. The working surface 28 may, in certain instances, be perforate, but normally, as shown, the working surface will be imperforate and provided with a peripheral rim or lip 32. A gap remains between the working surface 28 and the front and rear of the working chamber 24.

In its lower part, the front panel 10 is recessed inwards as at 34 (Fig. 2) and is formed with an access opening 36, the upper part of which is screened by a removable transparent panel 38 held in place by knobs

40. By way of the opening 36 a user can reach into the working chamber 24 with his hands and work on and/or manipulate articles, materials, reagents and so on, on the working surface 28.

5 The main filter 26 serves as the ceiling of the working chamber 24 and separates the latter from a fan chamber 42 (see particularly Fig. 2) accommodating an outlet filter fan 14 and two main filter fans 44a. The fan chamber 42 has a front wall 46 spaced inwards
10 from the upper part of the front panel 10, in which there is an air outlet aperture 48. An outlet filter 50 is provided in this aperture 48 and the air output from the outlet fan 14 is able to pass out of the cabinet by way of this aperture 48.

15 Above the fan chamber 42 and separated from the latter by an entry filter 52 is an air entry compartment 54.

 The rear of the working chamber 24 is provided with an inclined baffle 56 which serves to define,
20 at the lower part of the working chamber 24, a rear exhaust chamber 58. This latter chamber 58 communicates with the air entry compartment 54 by way of air transfer ducts 60 (see Fig. 1) extending upwards of the two sides of the cabinet and defined by secondary walls 62
25 extending upwards from the sides of the working surface

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28 and spaced a small distance away from the respective side panels 20, 22. The rear exhaust chamber 58 leads into the air transfer ducts 60 by way of a plurality of guide channels 64 at left and right.

5 The arrows in Fig. 2 of the drawings indicate, schematically, the course of the air circulation which occurs in the cabinet when the fans 14, 44a, 44b are in operation. As already explained, the air output from the fan 14 is able to pass through the output filter
10 50 and out of the cabinet by way of the aperture 48. The remainder of the output of air from fans 44a, 44b is able to pass through the main filter 26 and into the working chamber 24 where it serves to provide a current of filtered air over the user's hands working
15 in the chamber 24. Some of this air flows over the front edge of the working surface 28 and into the air space 30 therebelow. Correspondingly some of the air flows over the back edge of the working surface 28. All of this air flows into the rear air chamber 58 and
20 thence into the air transfer ducts 60 through the plurality of guide channels 64 (broken arrows 'A' in Fig. 2) through which it passes up to the air entry compartment 54 and then through the entry filter 52 and back down to the fan chamber 42. Since the volume drawn in

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by three fans 14, 44a, 44b exceeds that passing into the working chamber 24 by way of two fans 44a, 44b and the main filter 26, an inflow of outside air occurs by way of the access opening 36, effective to preclude the possibility
5 of contamination of the user by matter passing out of the cabinet by way of the opening 36.

Because the transfer ducts 60 extend up the sides of the cabinet, they do not inhibit access to the interior of the cabinet by way of the front or rear thereof, e.g.
10 for servicing. Indeed, the rear panel in the illustrated embodiment, is constructed of removable sections 66, 68, 70, 72 for this purpose. Moreover, the front to rear dimensions of the cabinet are lesser than would be the case where an air transfer duct is provided up the rear
15 of the cabinet between the air space 30 and the entry compartment 54, for an equal depth of working chamber 24.

The invention is not confined to the precise details of the foregoing example and variations may be made there-
20 to. Thus, for instance, if desired the air transfer ducts 60 may each be divided by suitable partitions (not shown) into a plurality of individual guide channels. If desired, the arrangement of the working surface 28 and the secondary walls 62 may be such that the air
25 space 30 communicates directly with the lower ends of the air transfer ducts 60. Other modifications are possible.

CLAIMS

1. A safety cabinet of the kind referred to having a fan chamber (42) housing one or more fans (14, 44_a, 44_b) disposed above a work chamber (24), an air entry compartment (54) above the fan chamber (42) and an air
5 space (30) below the working chamber (24), characterised by provision of air transfer ducts (60) extending upwards of the two sides of the cabinet so as to connect the lower air space (30) to the air entry compartment (54).
- 10 2. A safety cabinet as claimed in claim 1 and further including, at the rear of the lower part of the working chamber, a rear exhaust chamber (58) connecting the lower air space (30) to the air transfer ducts (60).
3. A safety cabinet as claimed in claim 2 wherein a
15 plurality of guide channels (64) extend between the rear exhaust chamber (58) and the air transfer ducts (60).
4. A safety cabinet as claimed in claim 1, 2 or 3 wherein the air transfer ducts (60) are divided by
20 partitions into a plurality of individual guide channels.

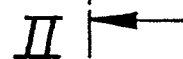
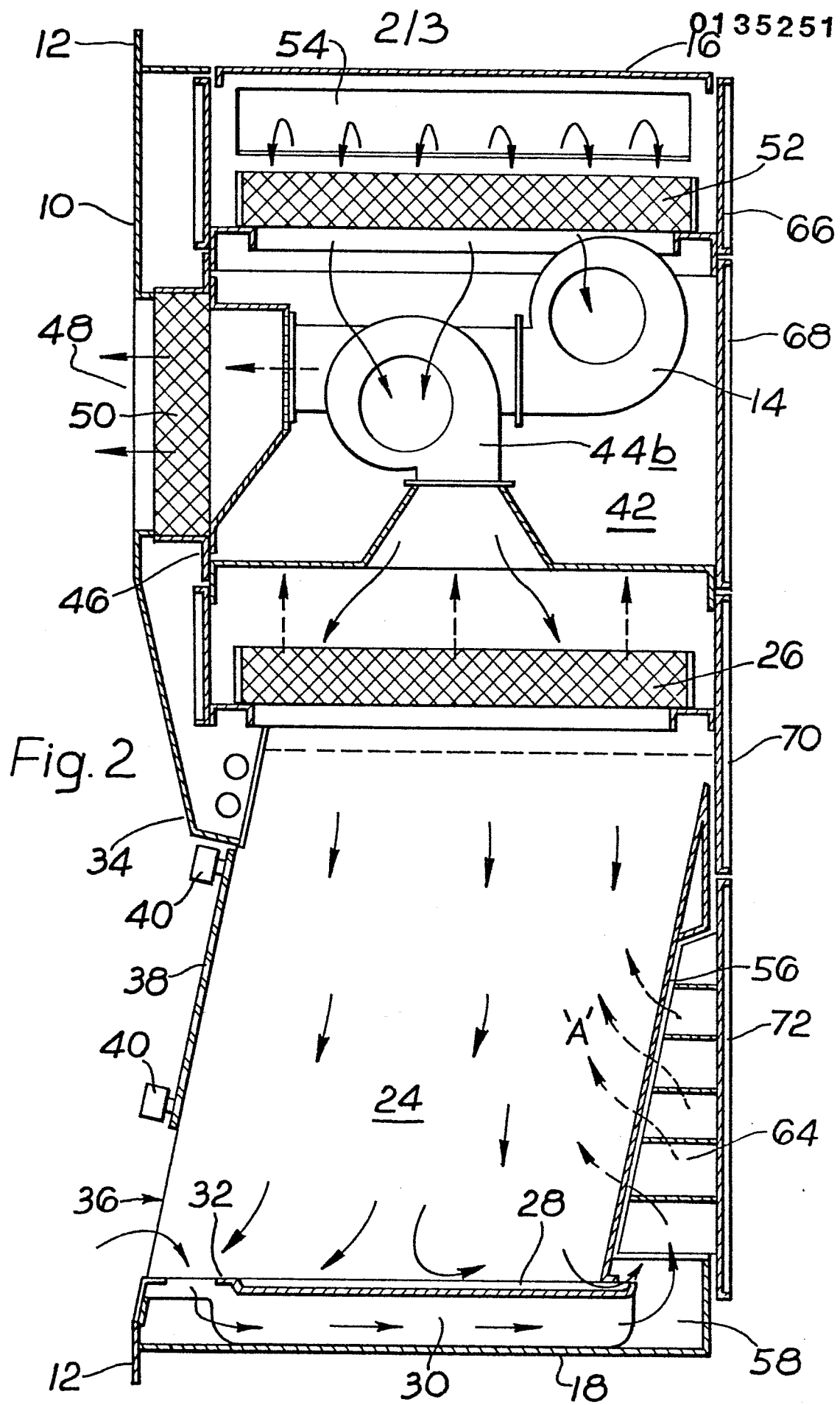


Fig. 1



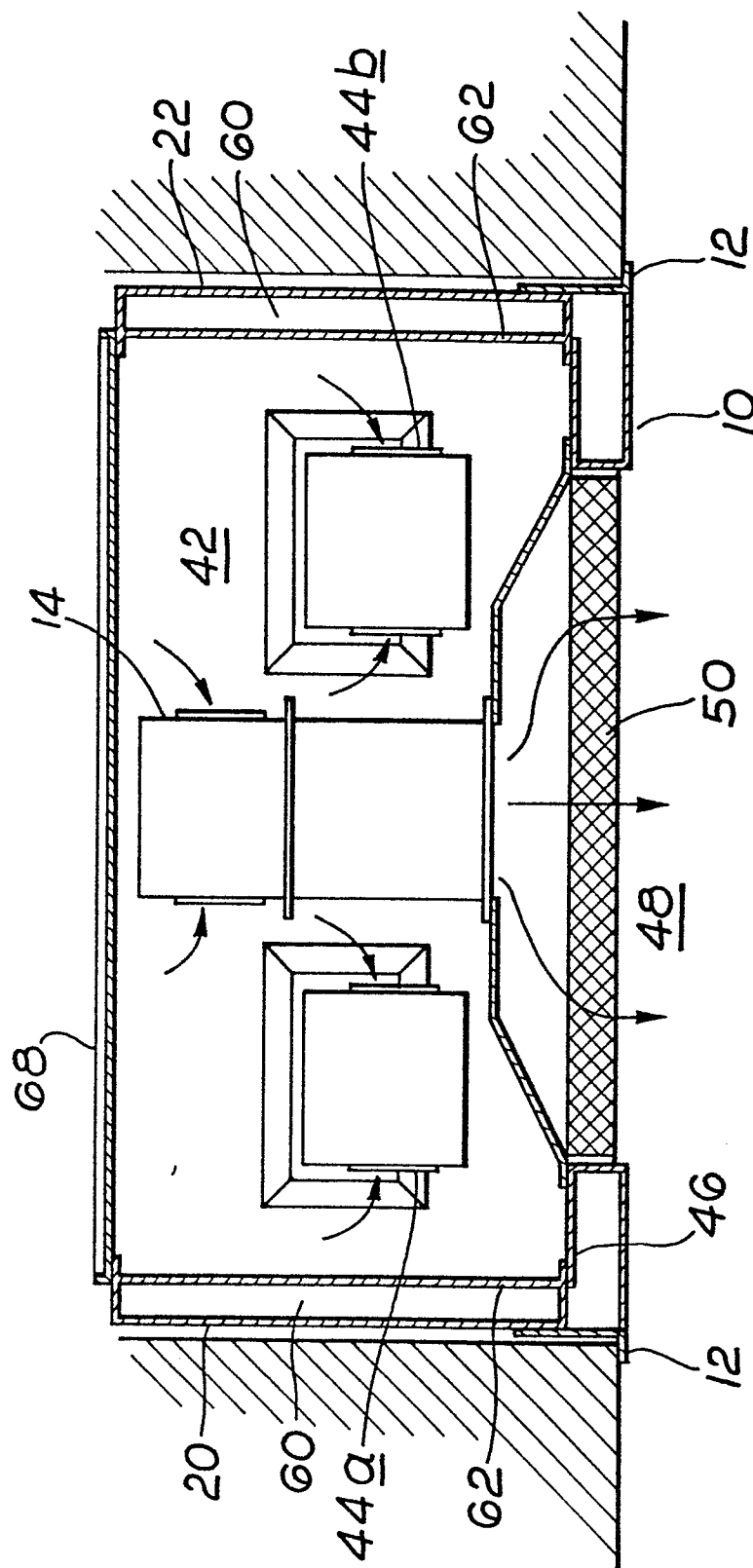


Fig. 3