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(72) Inventor: **Baker, David**
Keighley, West Yorkshire, BD21 1LE (GB)

(74) Representative: **Tomkinson, Alex**
Bailey Walsh & Co
5 York Place
Leeds LS1 2SD (GB)

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(71) Applicant: **Baker, David**
Keighley, West Yorkshire, BD21 1LE (GB)

(54) Washing apparatus

(57) Washing apparatus (2; 120) for washing ink off one or more printing trays (30) is provided. The apparatus includes a housing (4) defining a washing compartment (6) therein in which the trays to be washed are located in use. The compartment (6) has fluid inlet means (50) for allowing cleaning fluid to enter the compartment

and fluid outlet means (52) for allowing waste fluid to be drained from the compartment. The apparatus further includes a rotatable drum (16) provided in the compartment one or more support means (26) are provided on the rotatable drum (16) for the location and support of trays during a washing process.

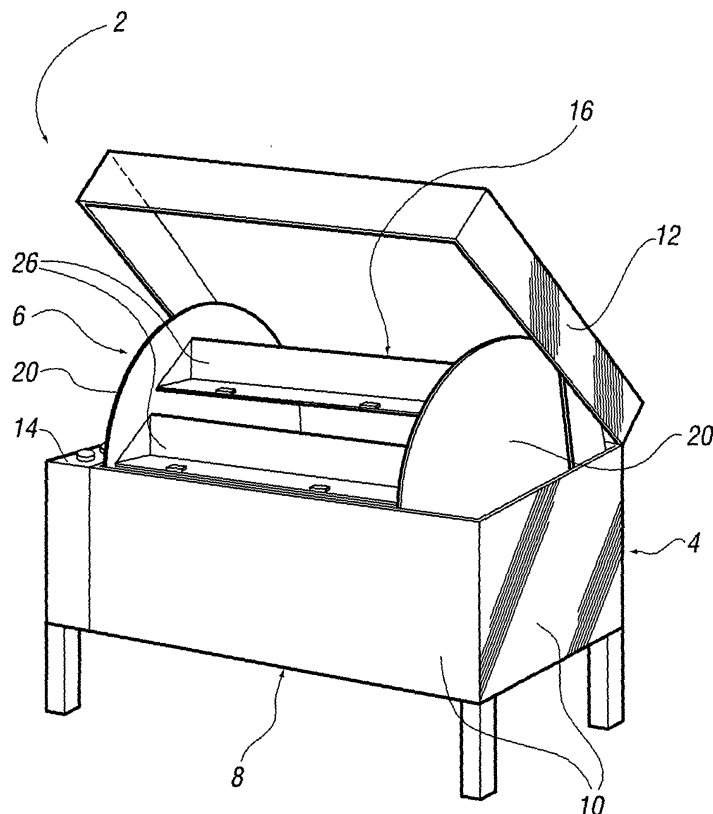


FIG. 1

EP 1 419 883 A1

Description

[0001] This invention relates to washing apparatus.

[0002] Although the following description refers almost, exclusively to washing apparatus for use in the printing industry, it will be appreciated by persons skilled in the art that the apparatus can be used in any number of different applications for washing one or more items.

[0003] In the printing industry, printing press components, such as the trays which contain the printing ink, rollers or other removable parts typically need to be washed and cleaned after each new printing run in order to prevent cross contamination of colours, prevent debris from being introduced into the printing process and/or the like. Currently the trays are washed by hand by the user but this is typically a time consuming operation and can result in soiling of the user's clothes or person. In addition, the solvent used to remove the printing ink from the trays may act as a skin irritant or may be harmful to certain users. As such, it is desirable to provide washing apparatus which minimises, if not prevents, user exposure to the wash solvent and/or printing chemicals.

[0004] An example of a known form of washing apparatus which has been designed to overcome the above problem comprises a housing defining a washing compartment therein. A grid is provided in the washing compartment for locating the items to be washed thereon. In operation, jets of wash solvent are forced up through the apertures defined in the grid to wash the items. Problems associated with this type of washing apparatus is that the apparatus is expensive and there is only a limited space on the grid surface. As such, only a small number of items can be washed at any one time, thereby making the wash process expensive. In addition, the loading process can be time consuming for the user as they may have to rearrange items, which are typically not uniform in shape, on the grid in order to get as many items on the grid as possible.

[0005] Other known forms of washing apparatus include conventional domestic washing machines which use rotatable drums as the washing compartment. The clothes to be washed are located in the rotatable drum and are freely rotatable therein as the drum rotates. This type of washing apparatus is clearly impractical for applications such as use in the printing industry, wherein the items for washing may be rigid or fragile and free rotation is likely to result in damage to the same and/or washing apparatus.

[0006] It is therefore an aim of the present invention to provide washing apparatus which overcomes the abovementioned problems.

[0007] According to a first aspect of the present invention there is provided washing apparatus for washing one or more items, said apparatus including a housing defining at least one washing compartment therein in which the items to be washed are located in use, said compartment having fluid inlet means for allowing wash-

ing fluid to enter said compartment and fluid outlet means for allowing waste fluid to be drained from said compartment, said apparatus further including at least one rotatable element provided in said compartment, and characterised in that said at least one rotatable element is provided with one or more support means for location and support of said one or more items therewith in use of said apparatus.

[0008] The at least one rotatable element rotates in the washing compartment during washing causing rotation of said one or more items, thereby increasing the exposure of said items to the washing fluid whilst reducing the time and volume of fluid required and thus increasing the efficiency of the washing process.

[0009] The one or more support means maintain the position of the items during the washing process to prevent damage to the items and/or the washing apparatus.

[0010] Preferably said at least one rotatable element is in the form of a drum or carousel unit located in said compartment.

[0011] In a preferred embodiment the at least one rotatable element is rotated about a substantially horizontal axis but it could also be rotated about an axis at an acute angle to the horizontal or the vertical.

[0012] Further preferably the drum or carousel unit has first and second ends and support means are attached to said first and/or second ends.

[0013] In one embodiment the support means are in the form of one or more arm members which extend substantially between said first and second ends.

[0014] In an alternative embodiment support means are provided separately and independently on said two ends.

[0015] The support means are typically movable with respect to the rotatable drum.

[0016] In either embodiment the support means are typically pivotally mounted on said at least one rotatable element, thereby allowing said support means to remain in a required orientation even during rotation of said rotatable element.

[0017] Preferably the support means are provided with location or engagement means for locating and maintaining an item on the support means during operation of the washing apparatus.

[0018] The engagement means can include any or any combination of one or more clips, VELCRO, friction fitting means, hooks, stoppers, protrusions/recesses, nuts and bolts and/or the like.

[0019] The support means can be designed to accommodate a single item of a pre-determined size or a plurality of items with the same or different dimensions.

[0020] Preferably drive means are provided to drive the rotation of the at least one rotatable element during a washing process.

[0021] In one embodiment the drive means is power driven using an electric or battery powered motor and gear mechanism. All or a substantial part of the drive means is typically located externally of the washing

compartment, thereby allowing the drive means to be substantially free from washing fluid. For example, the drive means can be provided in a further compartment of said washing apparatus.

[0022] In an alternative embodiment the drive means is manually driven using a handle or other similar means to allow rotation of the at least one rotatable element.

[0023] Preferably said fluid inlet means includes at least one jet or nozzle located in the washing compartment for spraying the washing fluid into the compartment. The jet or nozzle is typically directed onto said items to be washed.

[0024] Further preferably a plurality of jets are provided in the compartment and positioned at any suitable location for allowing the items to be washed efficiently and quickly.

[0025] In one embodiment the fluid inlet means are movable in said compartment during the washing process. For example, the jets could be movable along the base or side walls of the washing compartment via one or more guide rails.

[0026] Preferably the washing compartment is provided with closure means, typically in the form of a lid.

[0027] Preferably the closure means is moved between open and closed conditions by the provision of pneumatic operating means (i.e. pistons) or hydraulic operating means. The closure means are typically pivotally mounted and further preferably are pivotally mounted on the top of the apparatus for movement upwardly and away from the user between said closed and open conditions.

[0028] In one embodiment the compartment and/or closure means are provided with locking means. For example, the locking means may lock automatically on initiation of the washing process, thereby preventing user access to the washing compartment during a washing process for safety reasons. Alternatively the locking means can be manually actuated.

[0029] Preferably the washing apparatus is provided with control means for controlling operation of any or any combination of said washing apparatus, one or more washing cycles or processes, operation of locking means and/or the like. For example, the control means can include a timer and/or microprocessing means for allowing adjustment and/or control of the length of the washing process, the amount of fluid used in the washing process, the type of fluid used in the washing process, the speed of rotation of the rotatable element, movement of the fluid inlet means and/or the like. A display screen can be provided with the apparatus to allow information relating to the operation of the apparatus to be viewed by a user, such as for example, to display the status of the apparatus and/or one or more operating functions relating to the apparatus. The display screen could also be used by the user to select one or more required washing cycles.

[0030] In one embodiment audio and/or visual indication means can be provided to inform a user of the status

and/or one or more operation functions of the apparatus, such as informing a user that a particular stage of the wash process has been completed or is in progress, that a fault has been detected, that the fluid needs to be changed and/or the like. The audio means could include one or more alarms and the visual indication means could include one or more lights for example.

[0031] In a further embodiment a fluid reservoir is provided with said washing apparatus to allow said fluid to be checked and/or replaced as and when required. The fluid reservoir can be detachably attached to said apparatus and can be provided in or form part of a further compartment of the apparatus. Alternatively the fluid reservoir can be fixedly attached to the apparatus but can be emptied and/or refilled via pump means.

[0032] Preferably attachment means are provided on said fluid container to allow said fluid container to be detachably attached to said washing apparatus and/or to the fluid carrying means passing between the fluid container and the fluid inlet and outlet of the washing compartment.

[0033] The attachment means can include any conventional attachment means, such as one or more clips, nuts, bolts, screws, friction fit connections, threaded connections and/or the like.

[0034] Additional support means can be provided in the washing compartment if required, such as shelves, rotatable carousels and/or similar.

[0035] In a preferred embodiment the washing apparatus is used in the printing industry. The one or more items to be washed are typically printing items, such as ink or paint trays, rollers or any other releasable item from a printing press. The fluid used in the washing process is typically a suitable solvent used to clean printing items.

[0036] According to a second aspect of the present invention there is provided washing apparatus for washing printing ink from at least one article used in a printing process, said apparatus including a housing defining at least one washing compartment therein in which the articles to be washed are located in use, said compartment having fluid inlet means for allowing washing fluid to enter said compartment and fluid outlet means for allowing waste fluid to be drained from said compartment, said apparatus further including at least one rotatable element provided in said compartment and characterised in that said at least one rotatable element is provided with one or more support means for location and support of said one or more articles therewith in use of said apparatus.

[0037] Preferably the article is any or any combination of an ink tray, paint tray, roller or one or more other detachable components of a printing press.

[0038] According to a further aspect of the present invention there is provided a method of washing a substance from at least one item, said method including the steps of locating said item on support means associated with a rotatable element provided in a washing compart-

ment defined in washing apparatus and rotating said rotatable element in said washing compartment in such a manner so as to allow the at least one item to be washed.

[0039] A lid of the washing compartment is typically moved from an open position to a closed position before the washing process can take place.

[0040] Preferably the rotatable element is rotated with respect to fluid inlet means provided in said washing compartment, said fluid inlet means providing washing fluid in said washing compartment to wash said items.

[0041] Further preferably said method includes the step of draining waste fluid from said washing compartment during or after said washing process.

[0042] The present invention has the advantage that the wash time for the one or more items is significantly reduced compared to conventional washing apparatus (i.e. between 5 and 10 minutes wash cycles), the process is cleaner for the user and for the environment, user exposure to any harmful chemicals is minimised and the process is safer to use. In addition, a larger number of items can be located in the washing compartment compared to conventional washing apparatus.

[0043] An embodiment of the present invention will now be described with reference to the accompanying figures wherein:

Figure 1 is a perspective view of washing apparatus according to an embodiment of the present invention;

Figure 2a is a perspective view of a rotatable drum according to an embodiment of the present invention;

Figure 2b is an end view of the rotatable drum in figure 2a;

Figure 3a is a perspective view of a printing tray;

Figure 3b is a perspective view of the printing tray in figure 3a located on a support member;

Figure 3c is a perspective view of the support member in figure 3b in detail;

Figure 4 is a simplified plan view of the washing apparatus with the rotatable drum removed;

Figure 5 is a simplified view from the side of the washing apparatus with the side wall cut away;

Figures 6 and 7 illustrate a further embodiment of the present invention in a closed and open condition respectively.

[0044] Referring firstly to figure 1, there is illustrated washing apparatus 2 for use in the printing industry. The

washing apparatus comprises a housing 4 defining a washing compartment 6 therein. The compartment 6 has a base 8, side walls 10 and closure means in the form of a lid 12 for closing the opening to the wash compartment 6 during a wash cycle.

[0045] A control panel 14 is provided on the apparatus 2 for allowing user control of the washing apparatus.

[0046] The compartment 6 contains a rotatable drum 16 which rotates about a substantially horizontal axis (x), as shown by arrow 18 in figure 2a. The drum can also be rotated in a clockwise direction if required. Drum 16 has ends 20 and facing end surfaces 22, 24 have a plurality of support arms 26 attached therebetween.

[0047] The support arms 26 are pivotally mounted on ends 22, 24 at pivot points 28. This allows the support arms to move relative to the rotatable drum 16 and ends 20 during rotation of the drum, thereby allowing the support arms to remain in a forwardly facing direction throughout the washing process. This allows easy access to the support arms so that a user can rapidly locate the printing trays 30 thereon for washing and remove the same after washing. It also prevents the trays 30 from falling off the support arms as the drum 16 rotates.

[0048] A typical example of a printing tray 30 which may be washed in the apparatus is shown on its side in figure 3a. The printing tray is typically an open top container having a base 32, side walls 34 and end walls 36. The support arm 26 has clips 38 on a front surface thereof under which an upper edge 40 of the tray is located during the washing process. Location means in the form of stoppers 42 are also provided on a base 44 of the support arm 26, as shown in figures 3b and 3c.

[0049] In the embodiment illustrated herein, the support arms 26 comprise ends 46, base 44 and side walls 48. However, it will be appreciated by persons skilled in the art that the side wall 48 is not necessarily required since stoppers 42 and clips 38 sufficiently secure the tray on the support arm in use.

[0050] Referring to figures 4 and 5, the washing compartment 6 has a fluid inlet 50 and a waste fluid outlet 52. A conduit 54 is connected to fluid inlet 50 and a plurality of fluid jets 56 are located thereon. The fluid jets 56 are located adjacent base 8 of compartment 6 and are orientated in such a manner so as to spray fluid in a direction, typically at an acute angle to the vertical towards the rotatable drum. At this angle, the fluid is sprayed through the open top of the printing tray to hit the side wall 32, end walls 36 and base 34. Waste fluid falls onto side wall 34' of the tray and the base of the support arm is at a sufficiently acute angle to the horizontal when the tray is located thereon to allow waste fluid to run off wall 34' of the tray and onto the base 8 of compartment 6. Base 8 can also be provided at an angle sufficient to cause waste fluid to flow towards fluid outlet 52.

[0051] A fluid tank 58 is provided beneath washing compartment 6. The fluid tank 58 is provided with a filter 60 located on support means 62. Fluid is pumped by

pump 64, along pipe 66 from a bottom part 67 of fluid tank 58, through fluid inlet 50 and along conduit 54. Waste fluid is drained from fluid outlet 52, along pipe 68 and into an upper part 70 of fluid tank 58. The filter 60 filters the waste fluid causing any solids to be removed from the fluid. The filtered fluid then falls into the bottom part 67 of the filter tank 58 and is pumped back into compartment 6. In this manner, the fluid can be recycled a pre-determined number of times through the washing apparatus before being replaced. However, it will be appreciated by persons skilled in the art that the filter means can be located at any suitable point in the fluid conduits/reservoir and/or the washing fluid need not be recycled, thereby removing the requirement for the filter.

[0052] The fluid tank 58 is typically releasably engaged with the washing apparatus to allow its removal for cleaning, repair and/or replacement of fluid. In one example, the engagement means can be in the form of a flange on an upper surface of the tank which locates in a corresponding channel on the wash apparatus. Wheels or rollers can be provided on the fluid tank to allow the tank to be slid relative to the apparatus, thereby increasing the ease with which the fluid tank can be moved into and out of location with the washing apparatus.

[0053] Quick release clips can be provided on the pipes 66, 68 to disconnect the pipes from the fluid tank 58 to allow its removable as and when required.

[0054] In use, the rotation of rotatable drum 16 is driven by motor 72 and gear mechanism 74. The drum is typically programmed to rotate a number of times during a wash cycle, thereby allowing the items to pass the fluid jets a number of times per wash. For example, if a 3.5 horse power motor is used, the rotatable drum typically rotates at about 8 revolutions per minute, such that the items pass the fluid jets 32 times in a four minute wash. However, the speed of the drum can be adjusted, as can the length of the wash cycle, typically using processing means.

[0055] Rotation of the rotatable drum and/or flow of fluid through the apparatus can be driven by compressed air. The air pressure in the apparatus is such so as to allow control of the rotation of the drum at a first speed when the lid is open such that the speed does not result in a user's hand becoming trapped in the drum, and at a second speed when the lid is closed, thereby allowing rapid cleaning to take place.

[0056] In order to initiate activation of a washing cycle, a user is required to depress start buttons 76 and 78 simultaneously. This dual activation requirement provides a safety mechanism to avoid accidental activation of a washing cycle. An emergency stop button 80 is provided to stop the wash at any point in a cycle, together with a sequence button to allow the drum to be slowly rotated or rotated a pre-determined distance during loading of the trays onto the support arms.

[0057] A locking mechanism is also provided between the lid 12 and side wall 10 of the compartment. The

washing apparatus can be prevented from working until the lid has been closed and locked.

[0058] The locking mechanism typically comprises a piston, typically spring or pneumatically actuated, which is located through a corresponding aperture when in a locked position. The lock can be opened and closed manually or can be automatically open and closed upon activation of a washing cycle. In the latter case, a manual override means can be provided to allow the lock to be opened quickly in the event of an emergency.

[0059] The rotatable drum can be of any required size or shape to provide sufficient support for a required number of trays to be washed. For example, seven support arms are shown in the figures for the purposes of clarity but greater or fewer support arms can be provided if required.

[0060] The pump used is typically a diaphragm type pump and allows the fluid to be pumped into the washing compartment and, if necessary, allows the waste fluid to be pumped from the compartment and into the fluid tank. Thus, the pump allows continued circulation of fluid through the washing apparatus during the washing process.

[0061] The washing apparatus housing, fluid tank, support arms, rotatable drum and/or the like are typically made from stainless steel, thereby preventing or reducing the likelihood of rust formation. However, the apparatus and its components can be made out of any material suitable for the type of cleaning fluid being used and the items being washed therein.

[0062] A further embodiment of the present invention is illustrated in figures 6 and 7. In this embodiment the same features as described above are referred to using the same reference numerals.

[0063] Washing apparatus 102 has a lid 12 with a handle 104 thereon for allowing a user to move the lid between open and closed positions. A control panel 106 is provided on the front of the apparatus for controlling the same and includes two index buttons 108 for moving drum 16 in washing compartment 6 by pre-determined amounts to allow loading of said drum. Two buttons 108 are provided so that a user is required to use two hands to operate the same simultaneously, thereby preventing accidental knocking of one of the buttons which may result in rotation of the drum whilst the user has their hands in the washing compartment and thus injury to the user. An emergency stop button 110 is provided if it is necessary to stop the washing process during a cycle and a reset button 112 is provided to reset the system after emergency stop button 110 has been actuated.

[0064] An operation indicator light 114 is provided to indicate to user when a washing process is being undertaken. An air motor gauge 116 is provided to allow a user to determine the air pressure being used for rotation of the drum at any particular time. Thus, the air motor gauge provides an indication as to the speed of the carousel in the washing compartment 6. Air motor regulator dial 118 is provided to allow a user to adjust the

air pressure being delivered for rotation of the drum, thereby allowing control of the speed of the drum. A timer can also be provided on the control panel to indicate how far the apparatus is into a washing cycle.

[0065] Fluid jets 56 are provided in the washing compartment 6 on the front, rear and side walls and on the lid interior surfaces. The fluid conduits which connect fluid jets 56 in the lid are provided between the lid casing and the lid interior.

[0066] Baskets or shelves (not shown) are provided along the sides of the interior of the washing compartment 6 for supporting smaller items for washing in use. These baskets are typically provided with a plurality of perforations therein to allow drainage of cleaning fluid.

[0067] A fluid tank 120 is provided at the base 8 of the apparatus and is provided in a sealed container/compartment. Tank 120 is supported on a tray 122 located between the legs 124 of the apparatus. Wheels 126 are provided at the base of legs 124 to allow the apparatus to be easily transported and locking means 127 are provided on the wheels to prevent the wheels from moving once the apparatus has been moved to a required location.

[0068] The cleaning fluid used in the washing apparatus in one example is an ether based fluid. This fluid is filtered before the same enters the fluid inlet means of the washing compartment to remove any impurities therefrom.

[0069] Two taps 128, 130 are provided on side 10 of the apparatus to allow the fluid tank 120 to be drained and refilled respectively. Actuation of the drainage tap 128 allows fluid to bypass the jets 56 and to be dispensed into a waste fluid container (not shown). Actuation of refill tap 130 allows new cleaning fluid to be pumped into the fluid tank 120.

[0070] Support arms 26 are provided with a plurality of apertures or perforations therein to allow fluid to be drained therefrom.

[0071] For reasons of safety, all machinery or moving components, other than the rotatable drum 16 are provided in compartments in the apparatus. Thus, a pump is located in compartment 132, a motor and gear mechanism is located in compartment 134 and air regulation apparatus is provided in compartments 136 and 138. The compartments have detachable covers provided thereon to allow a user to access said moving parts for replacement, servicing and/or repair.

[0072] In one example, three gauges are provided for the purposes of measuring compressed air pressure in the apparatus. The first gauge is to measure air pressure to the pump. The second gauge is the pilot air supply gauge for measuring the incoming air supply to the valves and switches and the third gauge measures the air flow to the rotating drum. For example, the air supply to the drum changes depending on whether the lid is in an open or closed condition. With the lid in an open condition, the drum is provided to rotate at a much slower speed than with the lid in a closed condition. Four air

regulator valves are provided for regulating the flow of air through the system. A safety air valve is provided to prevent pressurisation of the apparatus.

[0073] Thus, in use of the apparatus, a user loads the rotatable drum by locating the items for washing on the support means. The user then shuts the lid of the washing compartment and activates a washing cycle. Upon activation of the washing cycle, cleaning fluid enters the washing compartment from the fluid jets and sprays the items to clean the same. The drum rotates to allow the items to pass the jets at least once and preferably a plurality of times, thereby allowing the items to be cleaned from different positions and angles. Once the washing cycle is complete a user can unload the items from the apparatus.

[0074] The present invention therefore provides washing apparatus which greatly increases the ease, rapidity and efficiency of the washing process.

Claims

1. Washing apparatus (2; 120) for washing one or more items, said apparatus including a housing (4) defining at least one washing compartment (6) therein in which the items to be washed are located in use, said compartment (6) having fluid inlet means (50) for allowing fluid to enter said compartment and fluid outlet means (52) for allowing waste fluid to be drained from said compartment, said apparatus further including at least one rotatable element (16) provided in said compartment and **characterised in that** said rotatable element (16) is provided with one or more support means (26) for the location and support of said one or more items therewith in use of said apparatus.
2. Apparatus according to claim 1 **characterised in that** the one or more items rotate with the at least one rotatable element (16) in the washing compartment (6) during a washing process in use.
3. Apparatus according to claim 1 **characterised in that** the support means (26) maintains the position of the items with respect to the rotatable element (16) in use.
4. Apparatus according to claim 1 **characterised in that** the at least one rotatable element (16) is rotated about a substantially horizontal axis (x).
5. Apparatus according to claim 1 **characterised in that** the at least one rotatable element (16) is in the form of a drum or carousel.
6. Apparatus according to claim 5 **characterised in that** the drum or carousel has first and second ends (20) and the support means (26) are attached to

said first and/or second ends.

7. Apparatus according to claim 6 **characterised in that** the support means (26) are in the form of one or more arm members which extend substantially between said first and second ends (20). 5
8. Apparatus according to claim 1 **characterised in that** the support means (26) are movable relative to said rotatable element (16). 10
9. Apparatus according to claim 1 **characterised in that** the support means (26) are pivotally mounted on said at least one rotatable element (16). 15
10. Apparatus according to claim 1 **characterised in that** engagement means are provided with said support means (26) for engaging said one or more items on said support means in use. 20
11. Apparatus according to claim 10 **characterised in that** said engagement means include any or any combination of one or more clips (38), VELCRO, hooks, friction fit means, stoppers, protrusions/recesses or nuts and bolts. 25
12. Apparatus according to claim 1 **characterised in that** said support means are provided with one or more apertures or perforations therein. 30
13. Apparatus according to any preceding claim **characterised in that** when said one or more items are located on said support means (26), said support means are orientated at an acute angle with respect to the horizontal. 35
14. Apparatus according to claim 1 **characterised in that** drive means are provided to drive the rotation of said at least one rotatable element (16) during a washing process. 40
15. Apparatus according to claim 14 **characterised in that** the drive means are manually driven using a rotatable handle. 45
16. Apparatus according to claim 14 **characterised in that** the drive means are power driven using a motor (72) and gear mechanism (74).
17. Apparatus according to claim 14 **characterised in that** the drive means are provided in a further compartment (134) in the apparatus. 50
18. Apparatus according to claim 1 **characterised in that** the fluid inlet means (50) are movable within the washing compartment (6). 55
19. Apparatus according to claim 1 **characterised in**

that the fluid inlet means (50) include at least one fluid jet or nozzle (56) located in the washing compartment (6) and/or closure means (12) for spraying the washing fluid into the compartment.

20. Apparatus according to claim 1 **characterised in that** at least the washing compartment (6) is provided with closure means (12) for movement between an open position, wherein the washing compartment can be accessed, and a closed position, wherein the washing compartment is closed.
21. Apparatus according to claim 20 **characterised in that** the closure means (12) are movable between said open and closed conditions by pneumatic or hydraulic operating means.
22. Apparatus according to claim 20 **characterised in that** the closure means (12) are pivotally mounted on said apparatus.
23. Apparatus according to claim 20 **characterised in that** the washing compartment (6) and/or closure means (12) are provided with locking means.
24. Apparatus according to claim 23 **characterised in that** the locking means includes a pneumatically operated piston which is located through a corresponding aperture in a locked position.
25. Apparatus according to claim 23 **characterised in that** the locking means includes a spring operated arm member which is located through a corresponding aperture in a locked position.
26. Apparatus according to claim 23 **characterised in that** the locking means is moved from an unlocked position to a locked position on activation of a washing cycle.
27. Apparatus according to any preceding claim **characterised in that** control means are provided for controlling the operation of any or any combination of the washing apparatus, one or more washing processes or operation of the locking means.
28. Apparatus according to claim 27 **characterised in that** the one or more washing processes can be controlled so that any or any combination of the length of the washing process, the amount of fluid used in the washing process, the type of fluid used in the washing process, the speed of rotation of the at least one rotating element, and the movement of fluid inlet means within the washing compartment.
29. Apparatus according to claim 1 **characterised in that** audio and/or visual means are provided to inform a user of the status and/or one or more oper-

ating functions of the apparatus.

30. Apparatus according to claim 1 **characterised in that** a display screen is provided with the apparatus to display and/or allow user selection of data relating to the status and/or one or more operating functions of the apparatus. 5
31. Apparatus according to claim 29 **characterised in that** one or more lights (114) are provided on the apparatus. 10
32. Apparatus according to claim 29 **characterised in that** one or more alarms are provided on the apparatus. 15
33. Apparatus according to claim 1 **characterised in that** a fluid reservoir (58; 120) is provided in said apparatus. 20
34. Apparatus according to claim 33 **characterised in that** the fluid reservoir (58; 120) is detachably attached to said apparatus.
35. Apparatus according to claim 33 **characterised in that** the fluid reservoir (58; 120) is located in or forms a compartment of said apparatus. 25
36. Apparatus according to any preceding claim **characterised in that** the fluid carrying means provided between the fluid reservoir (58; 120) and the washing compartment (6) are detachably attached. 30
37. Apparatus according to claim 34 or claim 36 **characterised in that** the attachment means include any or any combination of one or more clips (66, 68), nuts, bolts, friction fit connections, threaded connections or screws. 35
38. Apparatus according to claim 33 **characterised in that** filter means (60) are provided in said fluid reservoir (58; 120) and/or one or more fluid conduits communicating therewith. 40
39. Apparatus according to claim 34 **characterised in that** one or more wheels or rollers are provided on the fluid reservoir (58; 120). 45
40. Apparatus according to claim 1 **characterised in that** one or more shelves are provided in the washing compartment for the location of said one or more items thereon. 50
41. Apparatus according to claim 1 **characterised in that** the one or more items are any or any combination of ink trays (30), paint trays, rollers and/or other detachable components from a printing press. 55
42. Apparatus according to claim 1 for use in the printing industry.
43. Apparatus according to claim 1 **characterised in that** rotation of said rotatable element (16) and/or pumping of fluid through said apparatus is undertaken using one or more compressed air supplies.
44. Apparatus according to claim 43 **characterised in that** one or more air pressure gauges are provided to allow a user to monitor air flow through the apparatus.
45. Apparatus according to claim 43 **characterised in that** regulating means are provided to allow a user to regulate the flow of air through the apparatus.
46. Apparatus according to claim 1 **characterised in that** pump means (64) are provided for pumping said fluid in said apparatus.
47. Apparatus according to any preceding claim **characterised in that** pump means (64) are provided for draining and/or refilling the fluid reservoir (58; 120).
48. A method of washing at least one item, said method including the steps of locating said item on support means (26) associated with a rotatable element (16) provided in a washing compartment (6) defined in washing apparatus (2; 102) and rotating said rotatable element (16) in said washing compartment (6) in such a manner so as to allow the at least one item to be washed.
49. A method according to claim 48 **characterised in that** the rotatable element (16) is rotated with respect to fluid inlet means (50) provided in said washing compartment (6), said fluid inlet means (50) providing washing fluid in said washing compartment to wash said items.
50. A method according to claim 48 **characterised in that** said method includes the step of draining waste fluid from said washing compartment (6) during or after said washing process.
51. A method according to claim 48 **characterised in that** a user is required to actuate two buttons (108) substantially simultaneously in order to move the washing apparatus (102) into an operating condition.

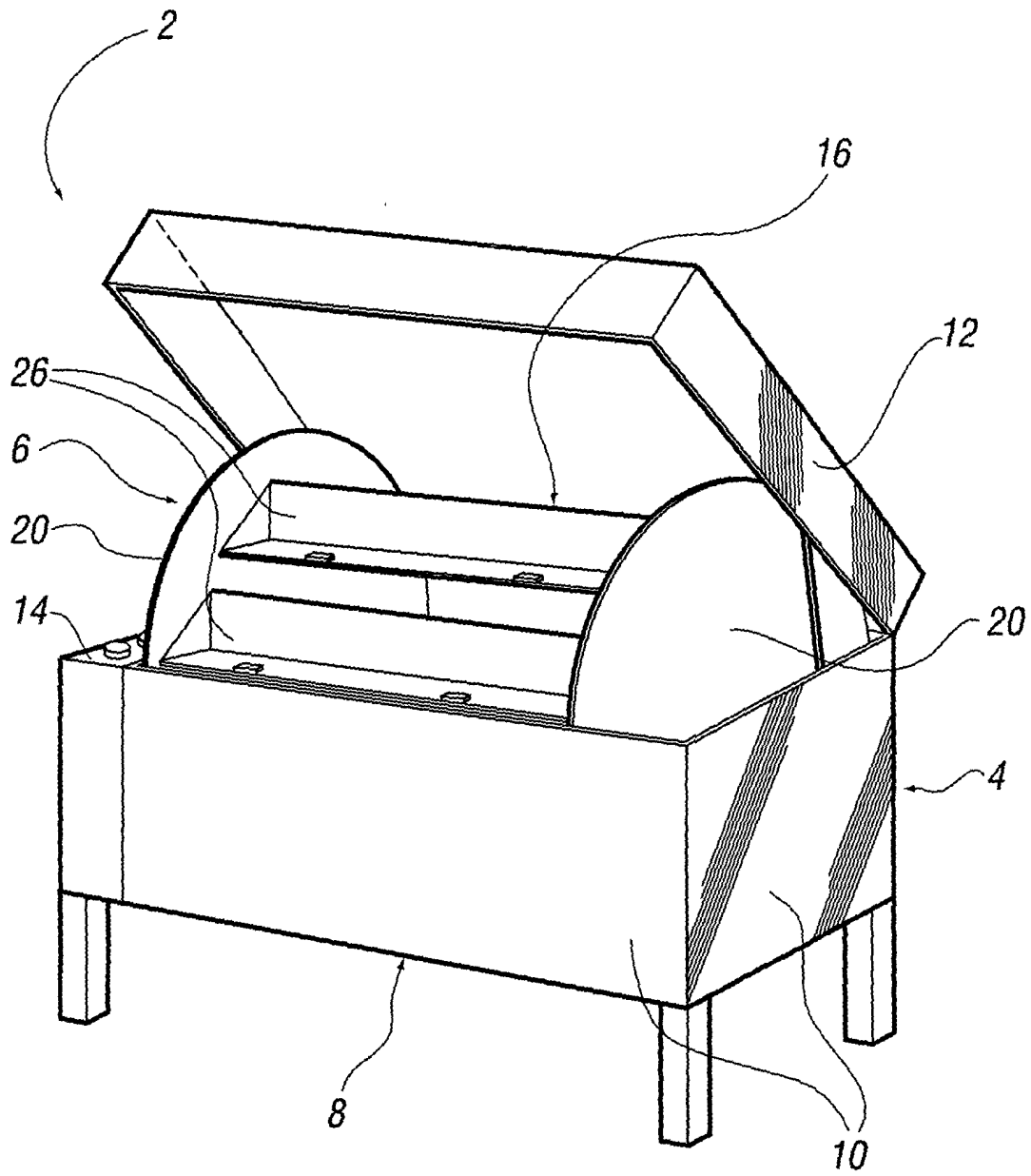


FIG. 1

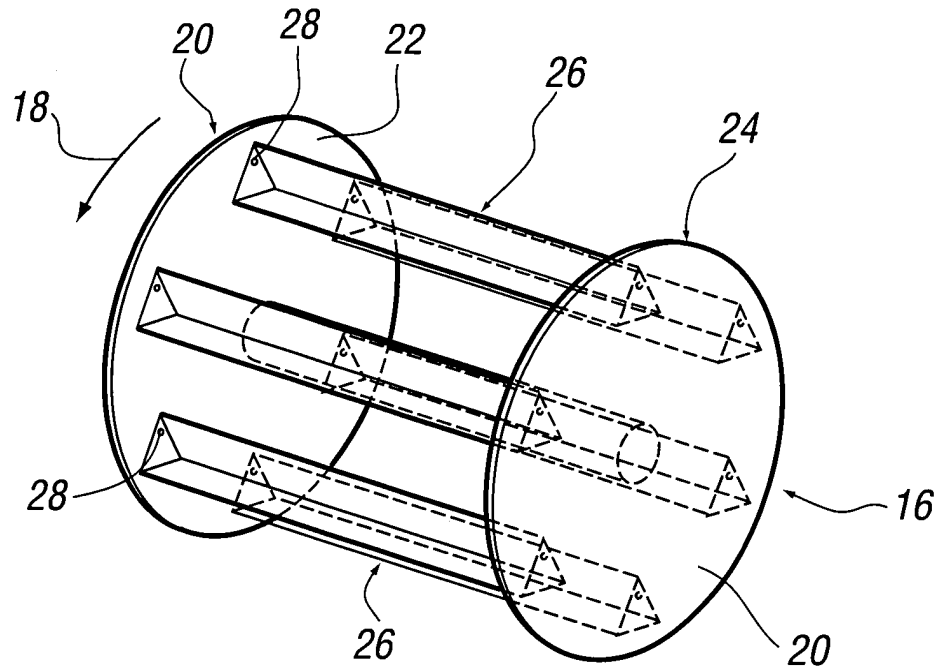


FIG. 2A

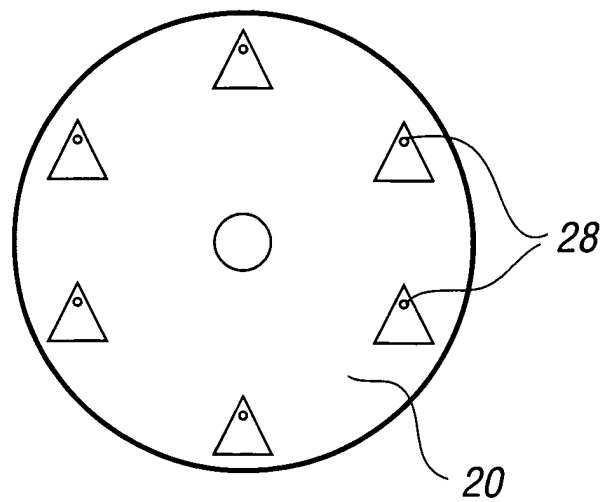
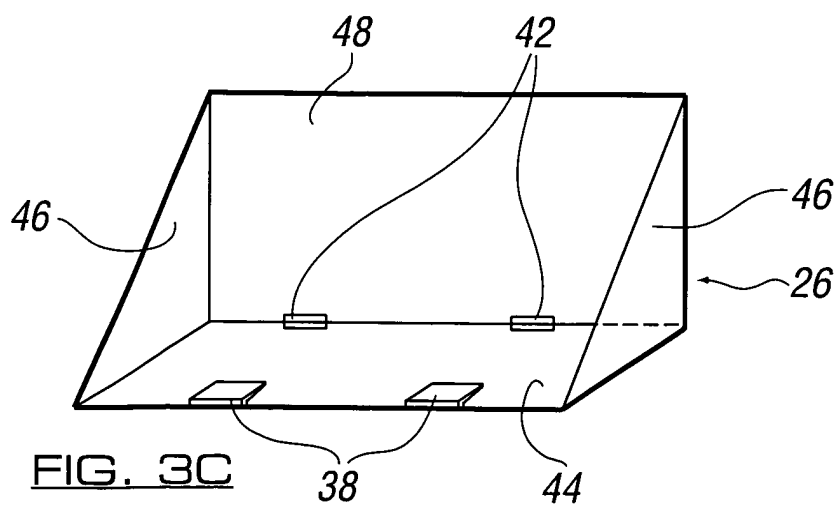
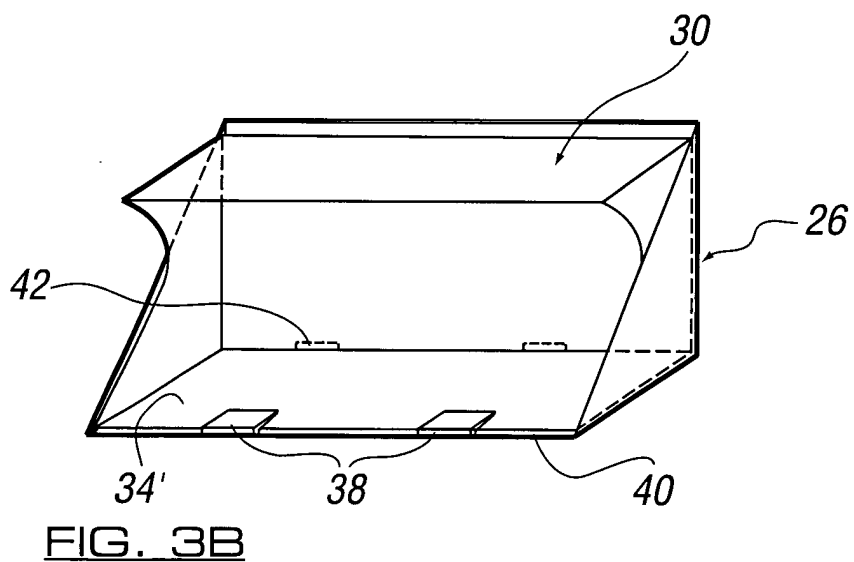
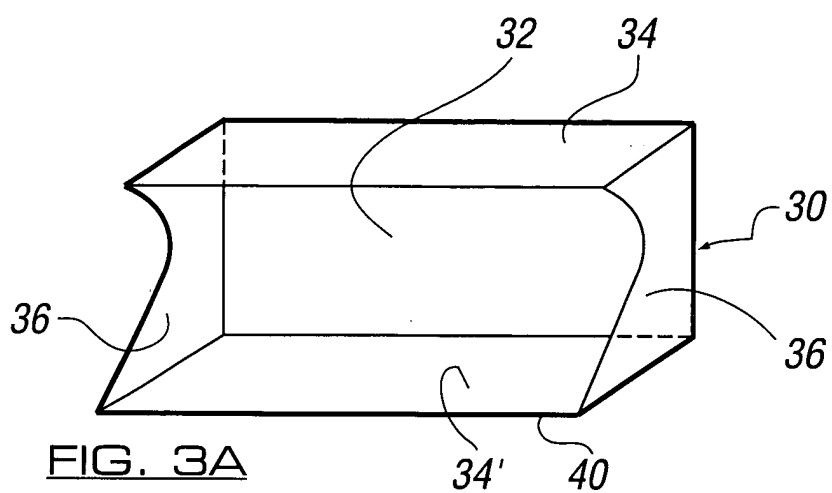


FIG. 2B



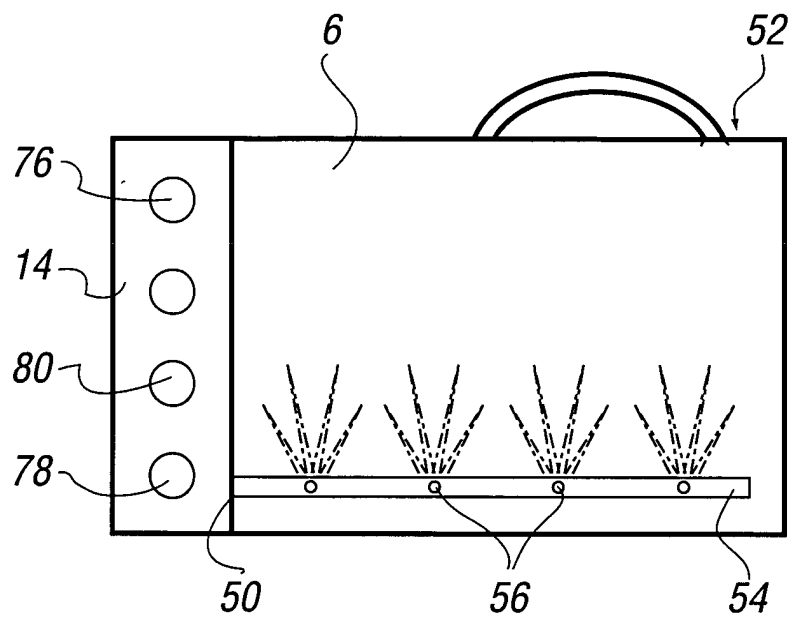


FIG. 4

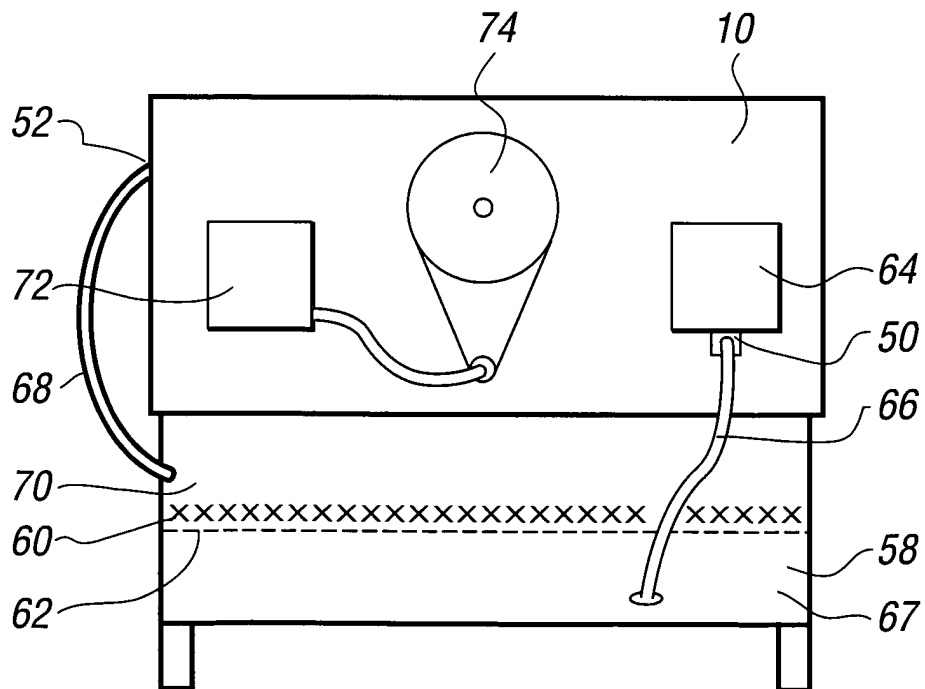


FIG. 5

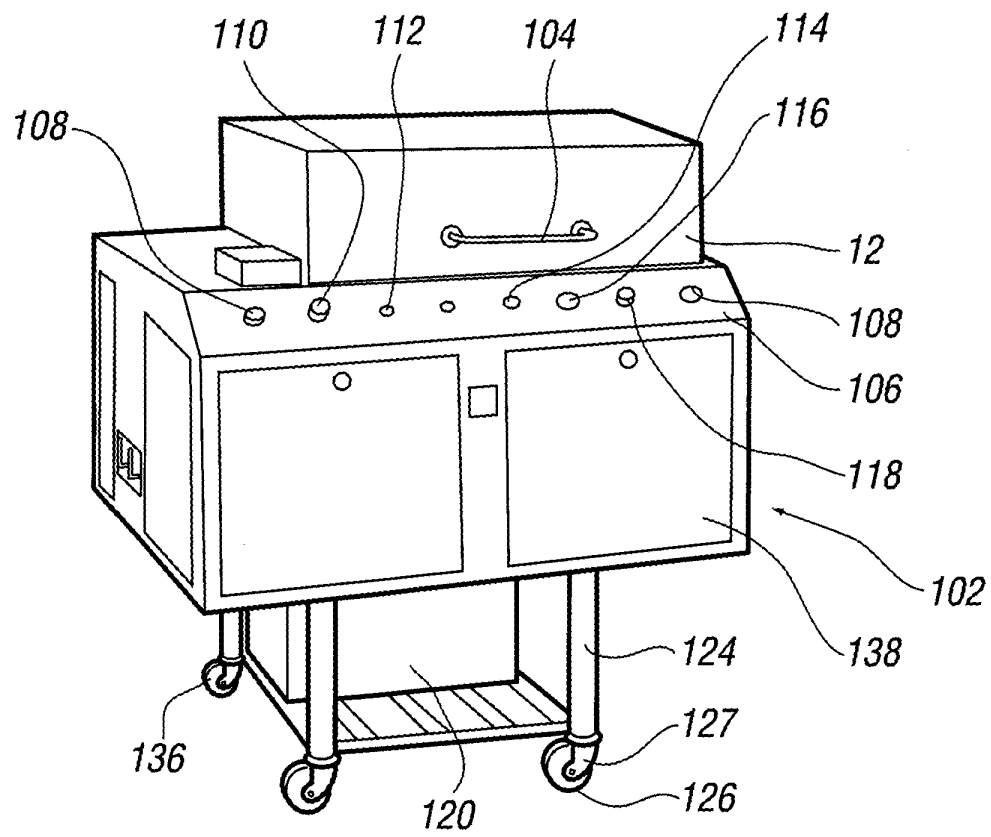


FIG. 6

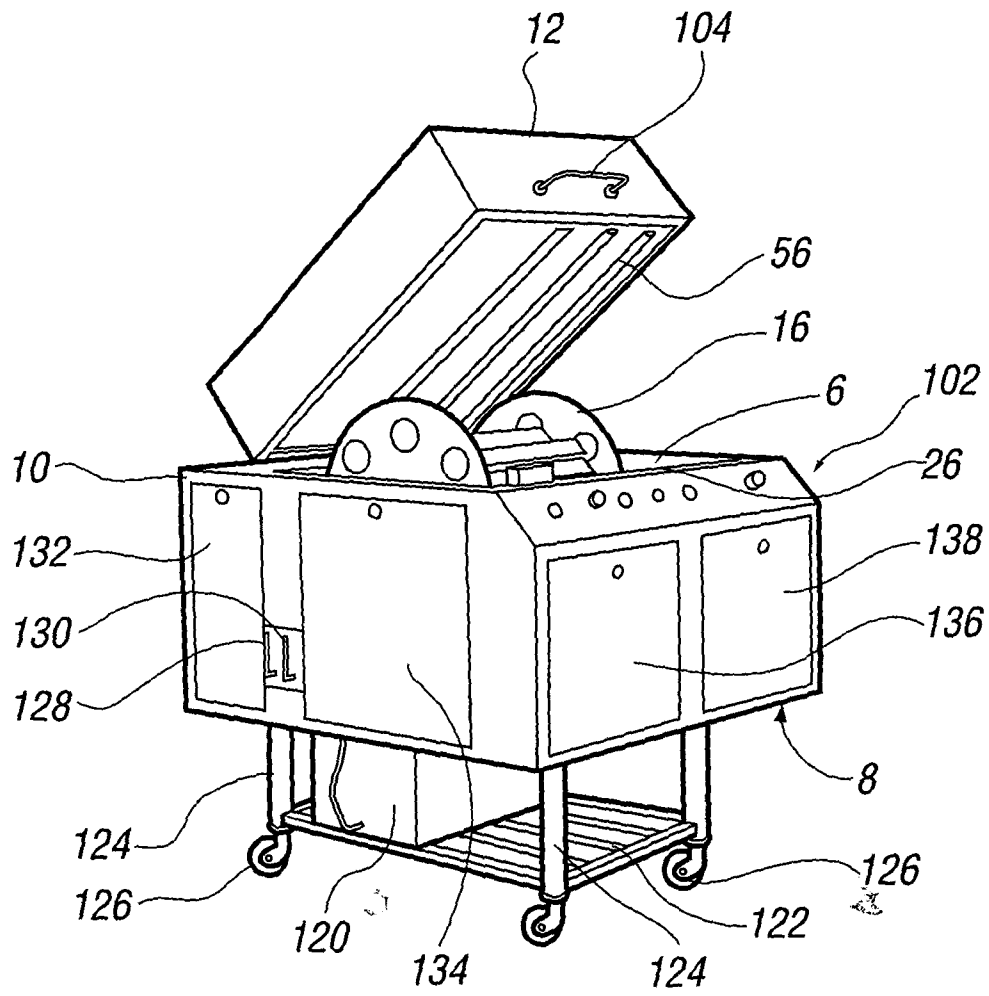


FIG. 7



European Patent
Office

EUROPEAN SEARCH REPORT

Application Number
EP 03 02 5925

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EPO FORM 1503 03/82 (P04C01)

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The members are as contained in the European Patent Office EDP file on
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25-02-2004

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