A manually operated washing device suitable for delicate textiles or for small amounts of laundry, which device both makes it possible to avoid direct contact with water and detergents, and minimises the amount of water and detergents necessary for obtaining a good result.
MANUALLY OPERATED WASHING DEVICE COMPRISING PLUNGER AND BUCKET

[0001] The present invention concerns a manually operated washing device with improved characteristics, minimizing the use of water and detergent.

BACKGROUND OF THE INVENTION

[0002] There are many instances when the need for manual washing arises. In developing countries, modern washing machines are still sparsely available, and the main part of the laundry is washed by hand in available buckets and basins, or in rivers and streams. This washing is almost exclusively done by women and constitutes a heavy work load for them. Regular washing in cold water often leads to arthritis, and the contact with detergents can cause allergies and eczema.

[0003] In industrialized countries, a single garment, under- wear or delicate materials are frequently washed manually, often in the washbasin. In families with children, the need of washing a single, soiled garment often arises. Not only do many people suffer from allergies and eczema, which are aggravated by contact with water and detergents, the over- use of detergents is a growing problem.

[0004] The object of the present invention is to make available a device for efficient and easy manual washing, using a minimal amount of water and detergents, and avoiding or at least minimizing the contact with water and detergents.

PRIOR ART

[0005] Various hand-operated washing devices have been disclosed, such as the device according to U.S. Pat. No. 1,780,155, consisting of a compressible cupshaped rubber body with a down- ward oriented non-yieldable flat surface. The flat surface is formed by the cupshaped body ending in an outward-oriented bead and an inward-oriented flange. The body, above the flange and bead is provided with a series of annularly arranged spaced openings and the walls provided by these openings are inclined downwardly.

[0006] The device according to U.S. Pat. No. 3,370,445 is in turn made entirely of a flexible material, forming an upper bellshaped member and a lower, collapsible semi-spherical member. The lower member has a number of openings or ports, preferably provided with integral annular beads or ribs projecting downwardly and outwardly thereof, in direct surrounding relation to the respective ports.

[0007] The closest prior art is however the manually operated washing device disclosed in FI 28 800, granted in 1957, as this consists of a container for water, detergent and clothes, in which a piston with a flexible cupshaped organ can be vertically moved, a grid at the bottom of the container and a channel for conducting water from the lower part of the container to the upper part of the container. The channel thus makes it possible to circulate the water by vigorously operating the piston.

SUMMARY OF THE INVENTION

[0008] The above defined problem is solved by a manually operated washing device according to the invention, the device having a movable plunger and an inner and an outer structure for containing water and the material to be washed. The material to be washed is placed in an inner structure having perforations in its bottom surface, and this inner structure placed in an outer structure and soaked in water. The device has spacing means to maintain a distance between the inner structure and the outer structure. These spacing means are preferably located on the outer surface of the inner structure. The inner structure further has openings near its upper rim.

[0009] Further embodiments of the invention will be evident from the description and claims, read together with the attached drawings.

SHORT DESCRIPTION OF THE DRAWINGS

[0010] The invention will be described in closer detail in the following description, with reference to the attached drawing, in which

[0011] FIG. 1 shows a cut-out perspective view of a device according to the invention.

DESCRIPTION

[0012] The present inventor has studied the available devices and found them less than satisfactory with regard to function and result. The device according to FI 28 800 is awkward to use, and the plunger does not suffice to create a strong flow, efficiently removing dirt and rinsing the materials to be washed. By replacing the plunger of FI 28 800, with a more advanced plunger as those disclosed in U.S. Pat. No. 1,780,155 or U.S. Pat. No. 3,370,445, a slightly more efficient device may be created, however still without creating a functional device. The channel provided in FI 28 800 for circulation of the water, is undersized and impractical.

[0013] The present inventor has surprisingly found, that a manually operated washing device having a movable plunger (1) must also comprise an inner (2) and an outer structure (3) for containing water and the material to be washed. Further, the inner structure shall have perforations (4) in its bottom surface, and spacing means (5 and 10) to maintain a distance between the inner structure and the outer structure. By limiting the perforations to the bottom surface and providing a space between the inner and outer structure, efficient water circulation is achieved. The perforations can have any shape, such as circular, square, rectangular, triangular or be shaped as slits. Preferably, the perforations are round holes having a diameter of about 8 mm.

[0014] The inner structure also has means for allowing water to re-enter from above, for example by lowering the rim of the inner structure or by providing openings (6) near its upper rim. These openings are preferably shaped as elongate apertures, making it easy to lift the inner structure.

[0015] According to the invention, the plunger (1) consists of a handle (7), a flexible bellshaped member (8) and an inflexible, perforated end surface (9). The handle may be a wooden rod, a T-shaped wooden or plastic handle or similar. The flexible bellshaped member is preferably made of a natural or synthetic flexible rubber material. The inflexible, perforated end surface is preferably made of thermoplastic material with sufficient strength, but it may also be made of metal, preferably corrosion resistant. According to a preferred embodiment, the inflexible, perforated surface has rounded knobs, protruding from the surface.
[0016] The inner (2) and outer structures (3) may be two generally cylindrical containers, the inner fitting into the outer. It is however preferred, that at least the outer structure has a cross section, which lacks rotational symmetry. Preferably both the outer and inner structure have an elliptical cross section, a cross section which resembles a rhomboid with rounded corners, or a cross section which resembles a square with rounded corners. By this arrangement, the position of the inner structure relative to the outer structure is secured, avoiding movements of the structure. By choosing the geometry of the inner and outer structures, the flow of water in the device can be controlled. Further, the correct assembly of the device is ensured.

[0017] In order to make sure that the water circulates efficiently, the inner structure is arranged at a distance above the outer structure. Preferably the distance between the bottom of the inner structure and the bottom of the outer structure is in the interval of 15 mm to 60 mm. Most preferably, the distance is about 30 mm.

[0018] Similarly, there is arranged a space between the side walls of the inner structure and the side walls of the outer structure. Preferably, the space between the sides of the inner structure and the sides of the outer structure is in the interval of 10 mm to 30 mm. Most preferably, the distance is about 20 mm.

[0019] The distance below and around the inner structure is preferably maintained with the aid of spacing means (5 and 10). The spacing means can be attached to either the inner or the outer structure, but they are preferably attached to the bottom and the sides of the inner structure. This has the advantage of facilitating the cleaning of the device.

[0020] The inner structure may further be equipped with a mark, e.g. a line indicating a maximal load. The outer structure may likewise be equipped with a mark, e.g. a line indicating a maximal water level.

[0021] The inner and outer structures are preferably made of a thermoplastic material, e.g. moulded in suitable plastic.

[0022] Preferably the outer structure is equipped with a rim and a handle so that it can function as a bucket.

[0023] When using the device according to the invention, the device is assembled and the outer structure is filled with water and detergent is added. The material to be washed, e.g. a single garment of delicate fabric, is placed in the inner structure. After mixing and assuring that the detergent is fully dissolved, the inner structure is placed in the outer structure. The material is allowed to soak for a time, sufficient for the detergent to act on the dirt. Using the plunger, water and detergent is forced through the material. By the action of the plunger, water is forced through the material to be washed and also circulated in the device.

[0024] The operation of the handle has a dual effect: Firstly, the function of the flexible bellshaped member and the inflexible, perforated surface creates a pumping action, forcing water in and out of the material. Secondly, the movement of the plunger acts as a piston within the inner structure, forcing water to leave the inner structure through the perforations in its bottom surface, and to re-enter over its upper rim or through the openings provided near its upper rim. The construction of the device according to the invention generates extremely good conditions both for removing the dirt from the material, and for mixing and diluting the dirt.

[0025] For rinsing, the inner structure can be removed from the outer structure and the dirty water emptied. The outer structure is then filled with clean water and the inner structure replaced in its position. By working the plunger, the material is efficiently rinsed. This procedure can be repeated until the desired result is achieved.

[0026] The device according to the invention not only has the advantage of minimising the amount of water and detergent needed, it also makes it possible for the operator to avoid wetting his/her hands and exposing them to possibly allergy-provoking detergents.

[0027] A further advantage is that the materials washed, e.g. a delicate fabric, is never subjected to any wringing or twisting action, as it is the case in normal manual washing or in machines centrifuging the laundry. One example of material, where the wringing action is detrimental, is wool. Wool is not suited for washing or the action of water, but very sensitive for mechanical working when wet. In a device according to the invention, the mechanical working is minimised, as the plunger only delicately touches the material, but efficiently forces water to circulate through the same.

[0028] The invention has many advantages for elderly and disabled, for singles and for persons suffering from allergies or arthritis or other conditions, aggravated by the contact with water. The invention is specially advantageous for out-door use, for holiday use or for use in developing countries, where a considerable amount of washing is done in rivers and streams.

[0029] Although the invention has been described with regard to its preferred embodiments, which constitute the best mode presently known to the inventor, it should be understood that various changes and modifications as would be obvious to one having the ordinary skill in this art may be made without departing from the scope of the invention as set forth in the claims appended hereto.

1. Manually operated washing device having a movable plunger (1) and an inner (2) and an outer structure (3) for containing water and the material to be washed, characterized in that the inner structure has perforations (4) in its bottom surface, spacing means (5, 10) to maintain a distance between the inner structure and the outer structure, and openings (6) near its upper rim.

2. Device according to claim 1, characterized in that the plunger consists of a handle (7), a flexible bellshaped member (8) and an inflexible, perforated end surface (9).

3. Device according to claim 2, characterized in that the inflexible, perforated surface has rounded knobs, protruding from the surface.

4. Device according to claim 1, characterized in that at least the outer structure has a cross section which lacks rotational symmetry.

5. Device according to claim 4, characterized in that both the outer and inner structure have an elliptical cross section.

6. Device according to claim 4, characterized in that the outer and inner structure have a cross section which resembles a rhomboid with rounded corners.
7. Device according to claim 4, characterized in that the outer and inner structure have a cross section which resembles a square with rounded corners.

8. Device according to claim 1, characterized in that the distance between the bottom of the inner structure and the bottom of the outer structure is in the interval of 15 mm to 60 mm.

9. Device according to claim 1, characterized in that the distance between the sides of the inner structure and the sides of the outer structure is in the interval of 10 mm to 30 mm.