

Innovative retrofitting of existing hand-washing systems to facilitate hands-free operability using locally available material

Problem Statement: In the present fight against virus-caused infections, frequent hand washing has been accepted scientifically as one of the prime ways in which to avoid contamination. However, most of the existing hand-washing equipment installed in public spaces uses regular tap-head tops, which need to be touched by hand to open and shut. After opening the tap, the user may sanitize his hands with utmost care. However, for shutting off the water supply, he is required to touch the tap head top again, causing possibility of re-contamination.

Challenge: to convert existing systems to handsfree systems in an efficient manner, using locally available material, in the absence of access to hardware shops amidst lockdown.

Solution offered: tap and liquid handwash dispensers that can be operated by the forearm (portion of the arm between wrist and elbow), or the elbow itself, thereby eliminating the need to touch by hand.

The solution proposed can be implemented without necessitating any change in existing installations, and with the use of scrap material commonly available.

Solution 'A'



Washbasin tap retrofitted with forearm/elbow operable lever

Solution 'B'



Liquid handwash dispenser fitted with forearm/elbow operable lever

Material used:

A. For washbasin tap

1. Aluminium strip. Such strips are available as leftover scrap as they are commonly used for electrical installations and for aluminium partitioning. It is chosen because it does not corrode or tarnish, is light and easy to maintain. Also, the life of viruses is low on metal, hence the strip is left un-encased. This also facilitates regular cleaning of the surface.

Alternately, a strip of other material such as copper may also be used, as copper has natural properties as a virucide. Copper tubing is frequently leftover from surplus tubes supplied with air conditioning units. Copper strips are also left over from electrical fittings.

2. Miscellaneous nuts, bolts and washers.

B. For handwash dispenser

1. Aluminium strip, for same reason as 'A-1' above.
2. Miscellaneous scrap plywood, with laminates (optionally) for decoration
3. Screws, nails, hinge, adhesive

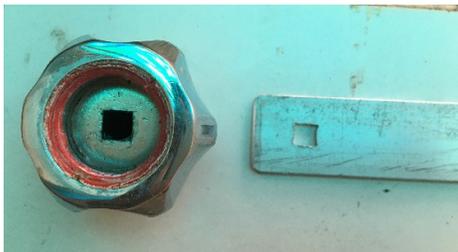
Minimal of tooling and machining is required.

Process:

A. Washbasin tap retrofitting



1. A scrap piece of aluminium strip is taken



3. Tap head cover is removed. An aperture matching the tap head cover is created on the cut aluminium strip.



2. It is cut into length of approximately 15 cm



4. Using original screws and washer of tap head cover and additional washers, aluminium strip is attached firmly.



Good water flow is obtained even with 1/8 turn of regular tap. No separate installation of half-turn or quarter-turn spindles is necessitated.

B. Hands-free handwash dispenser holder fabrication



1. A scrap piece of aluminium strip is taken



2. It is cut into length of approximately 15 cm

Wall mounts provided



3. The aluminium strip is affixed with a hinge into a suitable holder, made of scrap plywood and laminate. It may be wall-mounted. Provision of wall fixing is made.



4. It can easily be operated by forearm/ elbow. This holder can accommodate most commercially available handwash dispenser bottles.

Expected outcomes:

3. Development of attachments for retrofitting purposes as above, and sharing of the model for use by all offices.
4. At least one-third of all public washbasins and washing areas in MNNIT Allahabad to be converted to hands-free mode, including the tap and equipped with hands-free liquid soap dispensers.

Timelines: Two weeks from commencement.

Budgeted cost: Rs. 50,000/- towards labour and miscellaneous components.

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