The disclosure relates to a method and apparatus for cleaning rugs, upholstery and the like wherein a high pressure jet of hot liquid or steam cleaning solution, or steam or a combination thereof is discharged into the rug or the like, the cleaning solution then being tamped down into the rug by means of a tamping device such as a vibrator. The rug or the like is then quickly exposed to a vacuum to remove all dirt loosened by jet spray while the dirt is still in suspension.
JET-VIBRATOR-VACUUM SYSTEM AND METHOD

The present invention relates to a rug and upholstery cleaning method and system and, more particularly to a rug and upholstery cleaning system and method wherein a high pressure jet of hot detergent water, steam or the like is applied to the rug or the like, the rug in the region of the applied detergent water or steam being tamped by means of a tamping device and a vacuum then being quickly applied to the tamped region to extract all loosened and suspended soil or dirt.

Steam and vacuum generators for cleaning rugs and the like have been well known in the art for many years. While prior art cleaning systems of the above described type have provided acceptable results they have been incapable of placing all dirt and soil in rugs, upholstery and the like into suspension for extraction by the vacuum. For this reason, the prior art devices have been incapable of performing the optimum desired job.

In accordance with the present invention, there is provided a jet-vibrator-vacuum nozzle and method wherein a far greater amount of soil and dirt is capable of being placed in suspension for removal by the vacuum relative to prior art systems and methods, thereby providing rugs, upholstery and the like which are substantially cleaner than when using prior art methods and systems. The above is provided by utilizing an apparatus and method wherein a jet spray of hot cleaning solution is applied to the rug, upholstery or the like as in the prior art. However, the cleaning solution is then tamped into the rug to further loosen the dirt and place it into suspension. This is quickly followed by application of a vacuum as in the prior art to remove the suspended particles.

It is therefore an object of this invention to provide a system and method of cleaning rugs, upholstery and the like which removes more dirt than similar prior art systems and methods.

It is a further object of this invention to provide a method of cleaning carpets, upholstery and the like wherein the carpet is first subjected to a jet spray of hot cleaning solution followed by tamping and then quickly followed by application of a vacuum.

It is a yet further object of this invention to provide a cleaning apparatus capable of applying a jet or high pressure spray followed by a tamping action and then quickly followed by application of a vacuum.

The above objects and still further objects of the invention will immediately become apparent to those skilled in the art after the following description of a preferred embodiment thereof which is provided by way of example and not by way of limitation wherein:

FIG. 1 is a partially cut away view in elevation of the jet-vibrator-vacuum systems of the present invention;

FIG. 2 is a cross-sectional view of the jet vibrator-vacuum system of FIG. 1; and

FIG. 3 is an enlarged view with bar 23 omitted from views showing action of soil before and after tamping.

Referring now to the drawings, there is shown a portable system having a housing 1, a handle 3 secured to the housing for pulling the housing and a wheel 5 rotatable on an axle 7, the ends of the axle being secured by brackets 9 to the housing. Within the housing there is formed a vacuum chamber 11 having a vacuum inlet 13 formed by a pair of flanges 15 and 17, the flanges being coplanar and capable of lying flat on the surface being cleaned so that air entering the vacuum inlet must travel through the element being cleaned. A vacuum hose 19 is coupled to the vacuum chamber and extends externally to an extractor or vacuum pump (not shown).

A vibrator 21 is secured to the top of the housing 1 and a vibrator bar 23 having a flat lower surface is secured to the vibrator. The vibrator bar 23 extends downwardly so that its flat lower surface is substantially coplanar with the flanges 15 and 17, the vibrator bar being capable, during vibration, of extending below said plane to provide a vigorous tamping action. The vibrator could preferably operate at about 3,600 R.P.M.

A jet spray is provided upstream of the vibrator (on the side of the vibrator bar opposite the vacuum inlet) by means of a plurality of spray tips 25 which receive cleaning solution or steam from a chamber 27 which is connected to a high pressure solution providing device of about 50 to 250 PSI (not shown) through a solution control valve 29, a solution cut-off cock 31 and a high pressure solution inlet 33.

Each of the solution control valve 29, solution shut-off cock 31, vibrator 21, extraction pump and high pressure solution providing device can be controlled by controls positioned on the handle 3 (not shown).

In use, the system is turned on whereby cleaning solution is provided at the high pressure solution inlet 33 under high pressure, the vibrator is on and the extraction pump is creating a vacuum. The solution shut-off cock 31 is opened and the vacuum nozzle is set to the desired position. The system is now operating and is manually pulled in the direction of the arrow as shown in FIGS. 1 and 2. Initially a jet spray is applied to the rug, upholstery or the like to loosen soil and place same in suspension. The vibration then tamps the cleaning solution further into the rug, etc., and loosens dirt and keeps it in suspension. The vacuum now removes all soil and dirt in suspension to provide the desired cleaning action.

Though the invention has been described with respect to a preferred embodiment thereof, many variations and modifications thereof will immediately become apparent to those skilled in the art. It is therefore the intention that the appended claims be interpreted as broadly as possible in view of the prior art to include all such variations and modifications.

What is claimed is:

1. A system for cleaning a textile article on a support comprising,
   a carriage movably over the article supporting first, second and third devices mounted adjacent each other for positioning over a predetermined area of the article in succession in the order named when said carriage is moved forwardly in one direction, the first device comprising means for forcefully projecting a cleaning fluid spray from a source of such fluid under high pressure onto said predetermined area, the second device being adjacent the first device and comprising means for tamping the predetermined fluid covered area of the article, the third device comprising a housing adjacent the second device having an open end facing the article rearwardly of the first and second devices and provided with means for creating a suction,
3. A system according to claim 1 whereby the soil in the predetermined area is first loosened by the fluid under pressure, the soil is then set into motion by the tamping action and held in suspension by the fluid and the fluid with suspended soil therein removed from the article.

2. A system according to claim 1 wherein said fluid is steam at a high temperature.

3. A system according to claim 1 in which the fluid is a liquid cleaning solution.

4. A system according to claim 3 in which the cleaning solution is at a high temperature above the ambient.

5. A system according to claim 1 in which the fluid is a combination of a liquid cleaning solution and steam.

6. A system according to claim 1 including planar flanges extending outwardly from opposite edges of the open end of the housing and supporting the housing on the article.

7. A system according to claim 1 in which the second device tamps the predetermined area in a direction normal to the surface of the article.

* * * * *