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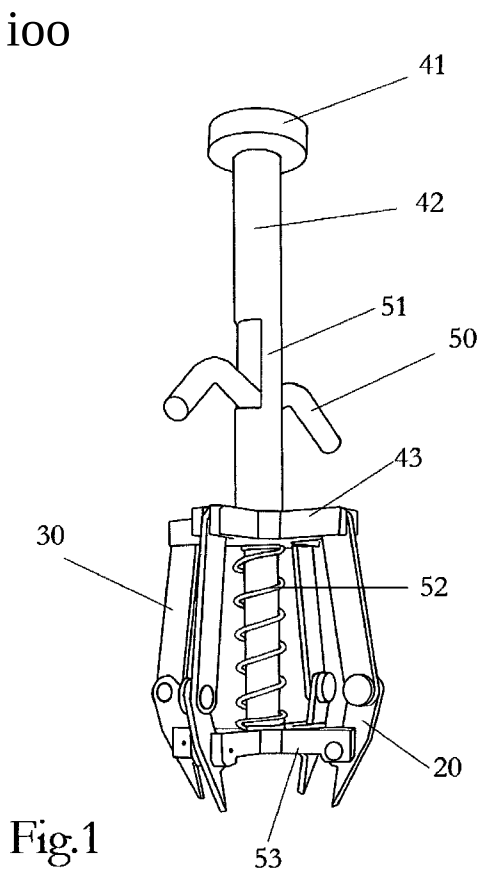

Fig.1

(57) Abstract: The present invention provides system and method for the extraction and removal of supporting spacers. A system (100) for the extraction and removal of supporting spacers may comprise of a number of claws (20); pivot rods (30); and an actuation element, having a palm-rest (41), a static rod (42), a static element (43), a finger grip (50), a sliding rod (51), a spring (52), and retaining element (53). A method for the extraction and removal of supporting spacers may comprise of a system (100) having a number of claws (20), pivot rods (30) and an actuation element, wherein the transition of claws (20) through the application of mechanical forces to the closed position of the system (100), brings the spacer (200) between the claws (20) and retaining element (53), and wherein pulling the system away from the assembly, causes the spacer (200) to be safely extracted and removed.

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SYSTEM AND METHOD FOR EXTRACTION AND REMOVAL OF SUPPORTING SPACERS.

TECHNICAL FIELD

[001] The invention refers to a system and a method for the extraction and removal of supporting spacers, used during the installation of tiles and other relative decorative or utility items in construction and decoration.

BACKGROUND OF THE INVENTION

[002] Contemporary practices and new materials and applications have developed the decorative and utility aspects of tiles and similar floor items and elements. Moreover, needs for further decorative properties and construction options have developed the bonding materials accordingly, e.g. in installations of floors with integrated heating systems, or tolerance specific applications.

[003] Bonding materials have developed to being a decorative element which promotes and supports the final aesthetic appeal and is deemed important in the final result of any such construction.

[004] hi most cases of such constructions, symmetry is a requisite, and the spacing of tiles is maintained with the use of (mostly) cross-shaped support spacers.
The installation of said spacers occurs during tile installation, and their removal occurs after the bonding material solidifies. Said spacer removal is deemed necessary to attain optimal adhesion of bonding material to the bonded elements, as well as the removal of other assisting or residual materials (extra bonding materials and/or wedges).
The tools, or other sharp objects which are used for the removal of said spacers do not guarantee the extraction of spacers adhered between elements, resulting in decreased efficiency and efficacy.

[005] Efficacy is decreased by the fact that during removal, parts of the spacers, or their entirety may be extremely hard to remove, leaving two options, the first of which being the covering of the spacer with bonding material, which may affect its coloration and its long term adhesion to the bonded elements, as well as the long term integrity of the assembly.

The second option is to persevere with makeshift tools designed for other tasks including wedges, screwdrivers, blades, mallets, etc, yet running the high risk of damaging bonded and/or adhered elements. Such events may decrease the quality, appeal or longevity of final assembly.

[006] In several cases the adverse effects of the above options aim to be avoided, by removing the spacers before the bonding material is completely dried. A common resulting observation in these cases is the potential misalignment and disarrangement of bonded elements. In most other cases, the bonding material is treated with liquids or other materials to ease the extraction and removal of the spacers.

[007] AU the above facts and methods decrease efficacy and degrade the quality of produced results, value of said results, and commonly demand added expenditures in time, man-hours, and materials, further decreasing efficiency.

[008] Efficiency is also decreased by the fact that the time needed to remove said support spacers is increased, and even more time is demanded in case of potential repairs due to inadequate or partial removal, and the practice/specialization demanded to refrain from potential damages on previous work.

[009] In view of the aforementioned and other limitations of the prior art, a new system and method of extracting and removing tile spacers are needed to overcome the aforementioned limitations.

SUMMARY OF THE INVENTION

[010] The main scope of the present invention is to provide a novel system and method of extracting and removing tile spacers, by employing a number of claws in radial arrangement, which under the application of mechanical forces, reach symmetrically under a spacer and enclose it.

[011] This inventive step improves efficiency by safely and firmly engaging all sides of said spacers concurrently, and with a single mechanical action.

[012] Pulling the system (vertically or otherwise) away from the assembly, safely extracts the spacer, with minimum affects to bonding material and no damage to the bonded elements.

[013] This inventive step improves efficacy by easing operation, and increasing the speed of tile spacers removal.

[014] These together with other scopes, features and advantages that characterize the invention are achieved by a system and a method having the main features as defined in the respective claims and will become evident upon examination of the ensuing detailed description of the preferred embodiments where reference numbers respond to respective items throughout.

BRIEF DESCRIPTION OF THE DRAWINGS

[015] Fig. 1 presents a perspective view of an embodiment of a system for extraction and removal of cross-shaped supporting spacers, with the claws set to the open position, before retaining and removing a spacer.

[016] Fig. 2 presents a side view of an embodiment of a system for the extraction and removal of cross-shaped supporting spacers, with the claws set to the closed position, after retaining a spacer.

DETAILED DESCRIPTION OF PREFERRED EMBODIMENTS

[017] Fig. 1 presents a side view of an embodiment of a system for the extraction and removal of cross-shaped supporting spacers, with the claws set to the open position, before retaining and removing a spacer. System (100) contains a number of claws (20), pivot rods (30), and actuation element.

[018] The number of claws (20) may be more than one, and may be placed in diametrically opposed positions and/or radially equidistant to each other.

[019] Actuation element comprises of a palm-rest (41), static rod (42) and static element (43), finger grip (50), sliding rod (51), spring (52), and retaining element (53). The moving

parts of the device are the finger grip (50), sliding rod (51), spring (52), retaining element (53), and claws (20). Static rod (42) fashions a concave configuration for the sliding rod (51) to slide in and operate the embodiment.

[020] The system is operated by resting palm-rest (41) on the palm of any hand (or pushing with a thumb), and then pulling on finger grip (50) until there is a firm grip on the spacer (200) to be removed, or until retaining element (53) and claws (20) have reached closed position, as in Fig. 2.

[021] Pivot rods (30) act as a fulcrum to the vertical forces that are applied through the actuation element on the retaining element (53).

[022] A spring (52) serves to return the actuation element and claws (20) to their open position and release the spacer (200) for disposal. The spring (52) interacts with static element (43) and retaining element (53).

[023] The system's (100) operation begins with the claws at an "open" position, when the system (100) is emplaced over the spacer (200), and during transition through the application of mechanical forces to the "closed' position [by pulling finger grip (50)], the spacer (200) is contained between the claws (20) and retaining element (53) and is ready for removal as shown in Fig. 2. Opening the claws (20) again [by releasing the finger grip (50)], releases the spacer (200) for disposal.

[024] Claw (20) width may be respective to the width of desired spacer (200) to be removed. Notwithstanding the above, smaller width claws (20) may remove most spacers of the same radial configuration (e.g. cross shaped), yet claws (20) of larger width than spacers (200) may not remove said spacers (200). For optimal efficiency claw (20) width must be smaller or equal to the width of the desired spacer (200) to be removed.

[025] System (100) and its components may be constructed of any materials displaying the properties desired and explained above. These may include a variety of alloys, or a combination thereof, with a variety of processing, treatments and coatings. These materials may also be homogenous, or a combination of multiple materials.

[026] According to embodiments, the mechanical forces needed to create the desired transition of the claws from the open to the closed position, may be created manually, electrically, hydraulically, pneumatic, or as a combination of these means, combined with various configurations and arrangement of levers, fulcrums, bell cranks and all known types of springs, so as to offset application points and deliver the forces needed for operation.

[027] It is considered obvious to anyone knowledgeable in the art that the principle of operation may be reversed so that the actuating mechanism functions as the pivot mechanism and vise versa.

[028] It is noted that the term "daw' is used as a means of description, and that said items (20) may be respectively and according to embodiment prong, tine, spike, wedge or otherwise shaped, for optimal operation.

[029] The above referenced embodiments are only illustrative and the present invention is limited only by the claims that follow.

CLAIMS

The claimed invention is:

L A system (100) for the extraction and removal of supporting spacers comprises:

a number of claws (20);

pivot rods (30) acting as a fulcrum to the forces that are applied through an actuation element on a retaining element (53); and

an actuation element, having a palm-rest (41), a static rod (42), a static element (43), a finger grip (50), a sliding rod (51), a spring (52), and retaining element (53).

2. The system (100) for the extraction and removal of supporting spacers according to Claim 1, wherein the claws (20) are placed in diametrically opposed positions.

3. The system (100) for the extraction and removal of supporting spacers according to Claim 1, wherein the claws (20) are placed radially equidistant to each other.

4. The system (100) for the extraction and removal of supporting spacers according to Claim 1, wherein each claw (20) is with a variety of shapes for optimal operation.

5. The system (100) for the extraction and removal of supporting spacers according to Claim 1, wherein the static rod (42) fashions a concave configuration for the sliding rod (51) to slide in.

6. The system (100) for the extraction and removal of supporting spacers according to Claim 1, wherein the spring (52) serves to return the actuation element and claws (20) to their open position and release the spacer (200) for disposal.

7. The system (100) for the extraction and removal of supporting spacers according to Claim 1, wherein the spring (52) interacts with static element (43) and retaining element **(53).**

8. The system (100) for the extraction and removal of supporting spacers according to Claim 1, wherein the actuating element functions as the pivot mechanism and vise versa.

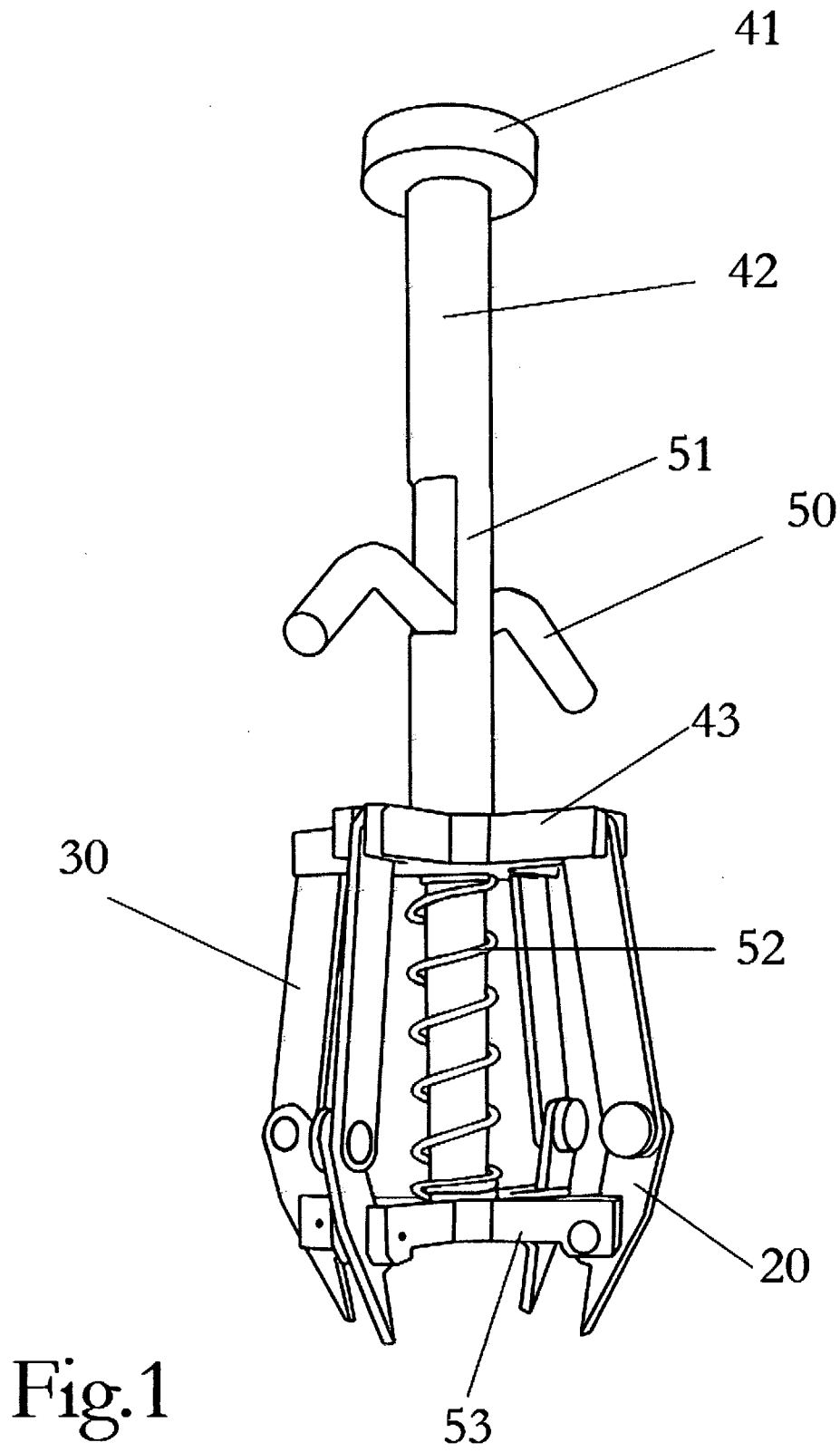

Fig.1

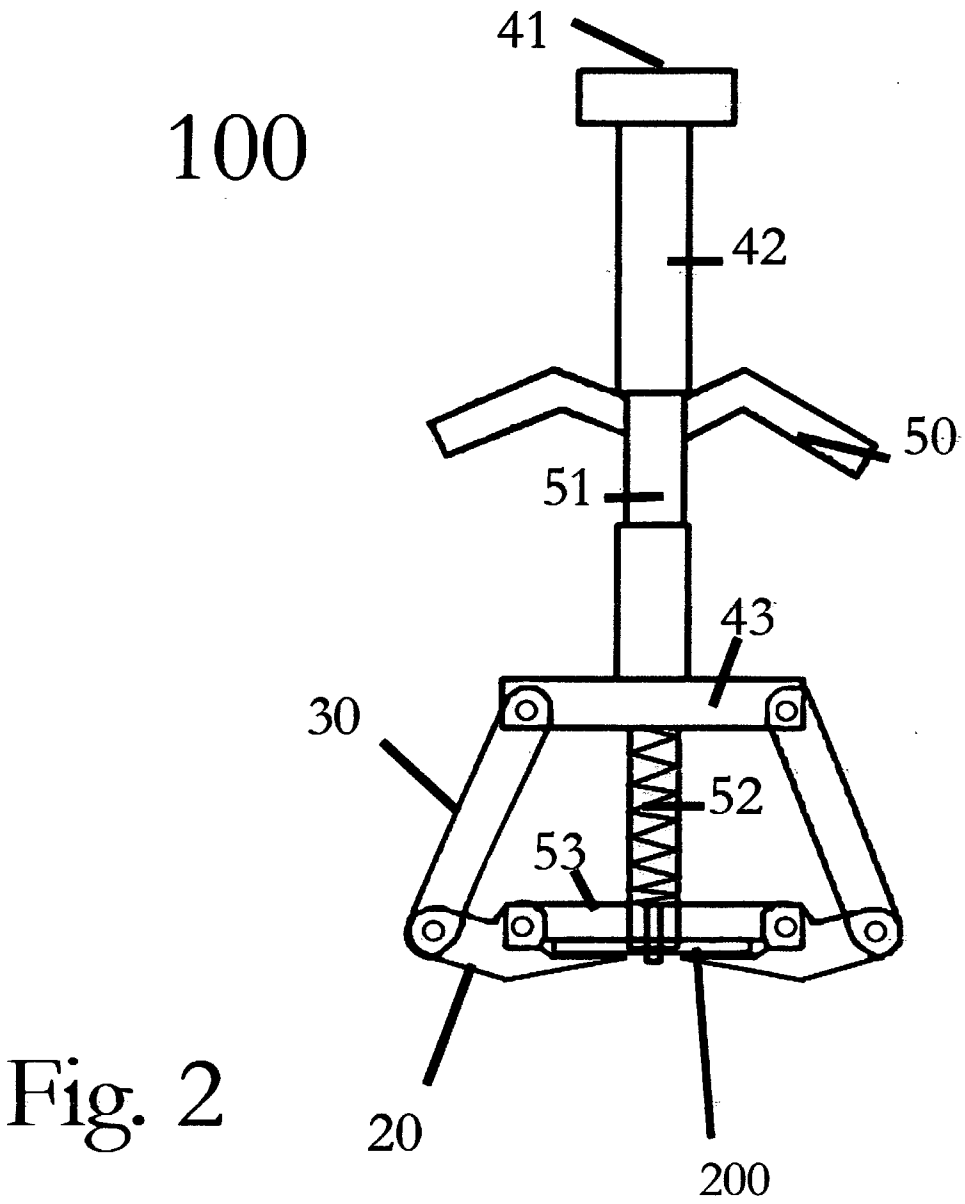

Fig. 2