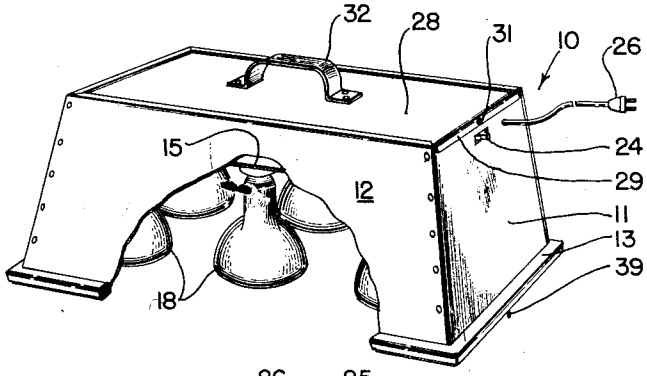
Nov. 9, 1954 A. J. BROCKMOLE 2,694,135

DEVICE FOR SOFTENING CEMENT BONDING FLOOR COVERINGS TO A SURFACE

Filed Oct. 3, 1952

FIG. 1.



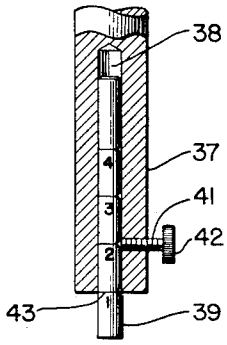


FIG. 5.

FIG. 2.

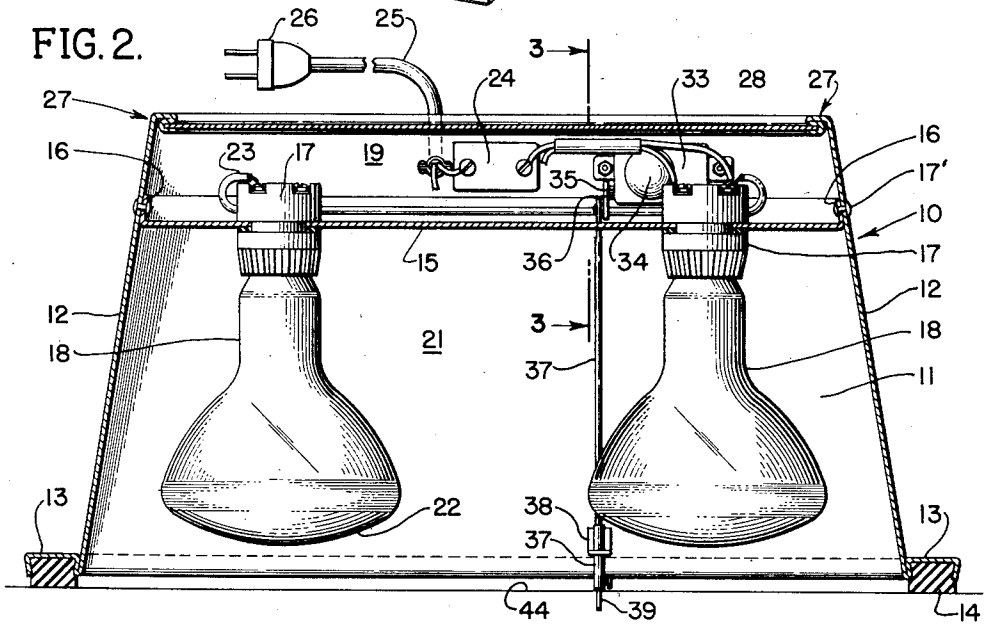


FIG. 4.

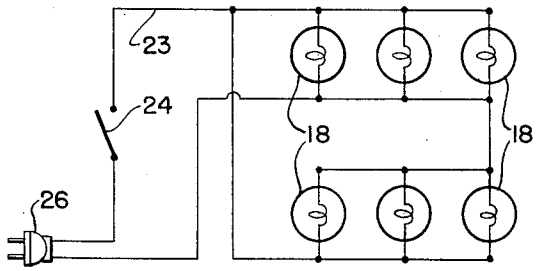
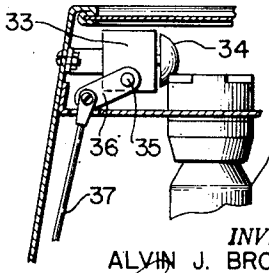


FIG. 3.



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DEVICE FOR SOFTENING CEMENT BONDING FLOOR COVERINGS TO A SURFACE

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Application October 3, 1952, Serial No. 312,960

6 Claims. (Cl. 219—34)

The present invention relates to a device for softening cement or the like used to bond floor coverings to a floor surface.

The device of the present invention is particularly useful in softening the cement ordinarily used to bond linoleum, asphalt tile, and similar floor coverings to a floor surface preparatory to removal of the floor covering from the floor. The removal of such floor coverings has heretofore been a tedious and time consuming job for generally it has been necessary to use some type of tool which was inserted between the covering and the floor, after which the tool was used to forcibly break the bond between the covering and the floor.

As the bond effected by the cement was in most instances a secure one, considerable energy had to be exerted before this bond was broken. This rendered the removal of the linoleum and like floor coverings extremely tiring to the worker. Oftentimes, unless extreme care was taken, the tool ruptured the floor covering or the latter was torn as the worker attempted to remove the covering after the tool had partially destroyed the bond.

With the device of the present invention, this removal operation is rendered extremely easy and without the necessity of any undue exertion of energy which heretofore has rendered the removal operation of these coverings not only tiring, but time-consuming as well.

The device includes a plurality of sources of infra-red heat which are so carried as to directly apply the rays emitted therefrom to the floor covering. These rays emanating from the sources penetrate the floor covering and are absorbed by the cement which, because of the resulting temperature rise, quickly softens to destroy the bond effected by the cement. Once the cement is softened and the bond destroyed, the removal of the covering is a relatively simple operation for generally the covering can be merely lifted from the floor.

The preferred embodiment of the device comprises a relatively large box-like casing member open at the lower side and in which are spacedly mounted the plurality of sources of infra-red heat. The sources are so mounted within the casing member that the same are disposed but a relatively short distance from the floor covering when the device is supported thereon. The rays from the sources are directed downwardly toward the covering and as they are largely absorbed by the dark body of the cement, a relatively fast temperature rise in the cement is quickly had. The temperature rise in the cement not only softens the same, but appears to generate gases which, in thermally expanding, actually force the covering from the floor.

To prevent dissipation of the rays and the heat generated by absorption thereof, the casing is imperforate and is formed at the normally lower side with structure which closely engages the floor covering and thus prevents the loss of the rays or the heat generated thereby.

The device is portable and is easily moved about the floor covering to be removed. In the preferred use of the device, the same is merely placed on the portion of the floor covering to be removed and after the cement has been heated a time sufficient to soften the same, the device is moved to a new location while the user separates the floor covering from the floor. In most instances, the time necessary to remove the floor covering from that area in which the cement has been softened is sufficient to soften the cement in the contiguous area

to which the device has been moved. Thus, only one operator is required to both soften and then remove the floor covering.

To indicate to the user the time interval the device has been at rest on a selected area of the floor covering, the present invention includes a timing mechanism rendered operative merely by the placement of the device on the floor covering. The timing mechanism once set for some preselected time interval will thereafter sound an audible signal at the termination of the preselected time interval following the placement of the device on the floor covering.

Other features and advantages of the present invention will be hereinafter apparent from the following description, particularly when taken in connection with the accompanying drawing, in which

Figure 1 is a perspective view of the device of the present invention with one wall broken away to more clearly illustrate the lamps carried within the casing;

Figure 2 is a section taken along line 2—2 of Figure 1;

Figure 3 is a fragmentary view in section taken along line 3—3 of Figure 2;

Figure 4 is a schematic view showing the circuit connections of the lamps; and

Figure 5 is a fragmentary view in section of an element of the present invention on an enlarged scale.

The device of the present invention, referring now to the drawing, comprises a body member **10** having opposed, imperforate end walls **11** and side walls **12**. The walls **11** and **12** are interconnected by some conventional fastening means to form a rigid casing structure. The walls **11** and **12** are preferably formed of sheet metal such as aluminum to reduce the over all weight of the body member and further to provide inner surfaces having high reflectivity. The lower edge of each of the walls **11** and **12** is reversely bent back upon itself to form a channel element **13** in which is mounted a strip **14** of resilient material, such as rubber. The strip **14** may be held in the channel element **13** by some cementitious material and the bond thus effected is augmented by clamping the opposing side walls of the channel element **13**, as clearly shown in Figure 2, about the strip **14**.

Arranged transversely of the casing formed by the walls **11** and **12** is a transverse longitudinal wall element **15**, each marginal edge of which is formed with a flange **16** facewisely engaged with the walls **11** and **12** and held thereto by rivets **17'** or other conventional fastening means. The wall **15** carries a plurality of lamp mounting elements **17**, each including a screw threaded socket for receiving the base of an infra-red lamp **18**. The transverse wall **15** forms within the casing an upper and lower compartment **19** and **21**, respectively, and the compartment **21** is of such a size relative to the lamp bodies **18** that the lower face **22** of the lamp is spaced a relatively short distance from the lower edge of the casing or body member **10**.

Conduits **23** carried within the chamber **19** interconnect, as shown in Figure 4, the socket members **17** and a switch body **24** to which is connected a twin conductor lead **25** carrying at its free end an attachment cap **26** adapted to be received within a suitable female receptacle connected to a source of current.

The upper edge of each of the wall members **12** is reversely bent back upon itself, as indicated at **27**, to form a groove longitudinally extending at each side of the casing or body member **10** adjacent the upper end thereof. The groove thus formed receives the opposite edges of a plate or wall member **28** for slidably mounting the same to the upper end of the body or casing member. The wall or plate **28**, when in the position shown in Figure 1, forms the top wall element of the casing or body member **10**. This plate or wall element **28** thus protects the conductors **23** and the connections between the same and the socket members **17** and the switch body **24**.

The plate or wall member **28** may be formed at the one end thereof with a flange **29** engageable with the one end wall **11** and held thereto by a bolt or the like **31** threaded into a tapped opening formed in the end wall **11** or some suitable boss mounted to the end wall. The bolt or the like **31**, therefore, holds the top wall **28** in

position although it is demountable from the casing by disengagement of the bolt 31 which frees the wall or plate member 28 for sliding movement longitudinally from the casing or body member 10.

Secured to the normally outer surface of the plate or wall member 28 is a handle element 32 for transporting the casing or for moving it from one floor area to another.

Mounted within the compartment 19 and supported by one end wall 11 is a mechanical timing mechanism 33 which may comprise a conventional mechanical timer having a spring driven escapement mechanism and an audible signal actuated through the escapement mechanism. The audible signal in the now preferred embodiment of the invention, comprises a clapper and bell arrangement, the bell being shown at 34. A shaft 35 rotatably carried by the timer is connected to tension the spring of the clock mechanism whenever this shaft is rotated.

The rotation of the shaft in the illustrated embodiment of the invention is brought about by a link or lever arm 36 fixed at one end to the shaft 35 and rotatably connected at the opposite end to an elongate rod 37 slidably supported at its lower end by a bracket element 38 fixed to the one end wall 11. The lower end of the rod 37, referring now to Figure 5, is formed with a bore 38 opening longitudinally therein from the lower end face, which bore slidably receives a pin 39. The pin 39 is adapted to be held in some preselected position in the bore 38 by means of a threaded stud 41 carrying a knurled operator 42. The pin 39 is preferably notched to receive the end of the threaded stud 41 to prevent accidental longitudinal movement of the pin 39 once the stud is tightened against the wall of a selected notch by operation of the knurled head 42.

Actually it should be seen now that the length of the rod 37 can be effectively changed by adjustment of the position of the pin 39 in the bore 38. In all positions of the pin 39 within the bore 38, the free end thereof projects downwardly beyond the normally lower edge of the casing or body member 10. Thus, the placement of the casing on a floor results in movement of the rod 37 upwardly to rotate the link 36, as viewed in Figure 3, in a clockwise direction and in turn rotate the shaft 35 in the same direction to tension the spring of the timer mechanism 33.

The amount of tension in the spring will depend on the amount of longitudinal movement of the link 36, which in turn, depends upon the extent of movement of the rod 37. To vary the extent of the movement of the rod 37 and consequently vary the amount of tension placed in the spring of the timer mechanism, the stud 41 is threaded out of engagement with the pin 39 and the latter moved to effect an adjustment of the overall length of the rod 37.

The pin is formed with spaced graduations 43 which cooperate with the end face of the rod 37, which serves as an index means, to indicate in intervals of time the tension placed in the spring of the timer by the extent of the movement of the rod 37. As indicated by the adjusted position of the pin 39, illustrated in Figure 5, the rod 37 will be moved an extent sufficient to time an interval equal to that indicated by the graduation 43 as read by the index means formed by the lower face of the rod 37. Thus, in the setting of the pin 39, as shown in Figure 5, the rod 37 will be moved upward, whenever the casing is placed on a flat surface such as indicated at 44, a distance sufficient to tension the spring for a measured interval of one minute.

At the end of the measured minute the timer 33 will operate the clapper of the bell unit 34 to sound an audible signal to apprise the user that the device has been at rest on the floor covering for one minute. If, for example, it was desired to sound the audible signal at the termination of a three minute interval after the casing had been moved to a new area, the pin 39 would be withdrawn from the bore 38 until the graduation numbered "3" was exposed at the end face of the rod 37. This, as will be seen, increases the effective length of the rod 37 and increases the arcuate movement of the lever arm 36 resulting in more tension being imparted to the spring of the timer. The amount of tension imparted to the spring in this adjustment of the pin 39 will cause the clapper of the bell unit 34 to sound the audible signal at the termination of a three minute interval.

Once the casing is removed from the floor the weight of the rod 47 acting through the arm 36 resets the shaft 35 to permit the timing mechanism to measure or time a second period as soon as the casing is again supported on the floor and the rod 37 is moved longitudinally or upwardly as viewed in Figure 3 to once again tension the spring of the timer.

In the intended use of the device of the present invention, the attachment cap 26 would be mounted in the female receptacle connected to the source of current to energize the lamps 18. These lamps are conventional infra-red lamps available on the open market and the rays emitted by each lamp impinge upon the floor covering exposed to the rays at the lower open end of the casing. These rays emanating from the lamps penetrate the floor covering and are absorbed by the cement bonding the floor covering to the floor structure. This brings about a temperature rise in the cement to quickly soften the cement which destroys the bond effected by the cement. Once the cement is softened and the bond destroyed, the removal of the covering is a relatively simple operation, as generally the covering can be lifted from the floor.

The user of the device, after he has determined the manner in which the floor covering is secured to the floor structure, sets the time interval necessary to soften and destroy the bond by manual adjustment of the pin 39. The operator then places the casing on the floor covering and at the sounding of the audible alarm, picks up the casing and moves it to the next adjacent area of the floor covering. As the floor covering can in most instances be merely lifted from the floor after the cement has been softened, the user can remove the floor covering under which the bond has been destroyed in the same time that it takes to soften the cement in the contiguous area to which the device has been moved. The process is then again repeated and the casing moved to the next contiguous area while the area in which the cement has just been softened is worked loose from the floor.

The resilient strips 14 actually perform two functions in the device for they, first, act as shock absorbers to lessen shock to the lamps 18 as the casing is repeatedly moved across the floor and, secondly, they tend to prevent the escape of the infra-red rays and the resultant heat from the casing. Thus, where the floor covering was not planar because it had in places worked loose from the floor or where it was badly worn, the resilient strips 14 act to seal the lower edge of the device engaged with the floor covering.

As the walls 11, 12, and 15 are formed of metallic imperforate sheets, preferably of aluminum, they inherently have a high reflectivity so that any reflected rays are directed downwardly and against the floor covering to increase the efficiency of the device.

Although the now preferred embodiment of the present invention has been shown and described herein, it is to be understood that the invention is not to be limited thereto, for it is susceptible to changes in form and detail within the scope of the appended claims.

I claim:

1. A device of the type described to be progressively moved over a floor area to soften cement bonding a covering to the floor, comprising: a casing formed of imperforate wall members open at its upper and lower ends; a plate element slidably carried by said casing and forming a closure means for the upper end thereof; a transverse, horizontally arranged wall member defining upper and lower chambers within said casing; a plurality of spaced electric socket means carried by said transverse wall member and opening into said lower chamber; an infra-red lamp mounted in each socket to emit its rays to impinge upon the floor covering exposed to said rays at the lower open end of said casing; electrical conduits carried within said upper chamber and connected to said socket means for supplying electric current to said lamps; and means carried about the normally lower edge of said imperforate walls forming coplanar means for sealingly engaging with the floor covering when the device is supported thereon.

2. A device of the type described to be progressively moved over a floor area to soften cement bonding a covering to the floor, comprising: a casing formed of imperforate wall members open at its upper and lower ends; at least one wall member being inclined to extend obliquely to the floor, the lower marginal edges of all

wall elements being disposed in a common plane; a plate element slidably carried by said casing and forming a closure means for the upper end thereof; a transverse, horizontally arranged wall member fixed within said casing and defining upper and lower chambers within said casing; a plurality of spaced electric socket means carried by said transverse wall member and opening into said lower chamber; an infra-red lamp mounted in each socket to emit its rays to impinge upon the floor covering exposed to said rays at the lower open end of said casing; an electrical receptacle carried by said casing; electrical conduits carried within said upper chamber and interconnecting said socket means and receptacle for supplying electric current to said lamps; and a handle element fixed to the normally outer side of said plate element for progressively moving the device over a floor area and for transporting said device.

3. A device of the type described to be progressively moved over a floor area to soften cement bonding a covering to the floor, comprising: a casing formed of imperforate, metallic wall members open at its upper and lower ends; a plate element; means for slidably mounting said plate element to said casing whereby the same forms a removable closure means for the upper end of said casing; a transverse horizontally arranged wall member defining upper and lower chambers within said casing; a plurality of spaced electric socket means carried by said transverse wall member and opening into said lower chamber; an infra-red lamp mounted in each socket to emit its rays to impinge upon the floor covering exposed to said rays at the lower open end of said casing; said lamps being of such a size and shape relative to the size and shape of said lower chamber as to substantially fill said chamber, whereby the lower face of each lamp is closely adjacent the floor covering; electrical conduits carried within said upper chamber and connected to said socket means for supplying electric current to said lamps; means carried about the normally lower edge of said imperforate walls forming coplanar means for sealingly engaging with the floor covering when the device is supported thereon; and a handle element fixed to the plate element whereby when said plate element is mounted to said casing the same may be lifted by the user and progressively moved over a floor area.

4. A device for softening cement bonding floor coverings to a floor surface, comprising: a casing member open at the lower end thereof and including a pair of imperforate converging side walls interconnected by a pair of imperforate end walls and a transverse wall, the marginal edges of which are fixed to said side and end walls

intermediate the normally upper and lower edges thereof; a plurality of sources of infra-red heat carried by said transverse wall and directing rays downwardly from said transverse wall; a plate element slidably mounted to the upper end of said casing member and forming a closing member for the upper end of said casing member; a timing mechanism carried by said casing member; means for actuating said mechanism, said means being made operative by the placement of said casing member on the floor covering to be removed; and a signal means actuated by said timing mechanism for indicating a time interval following the placement of said casing member on the floor.

5. A device as defined by claim 4 and including presettable means for selecting the time interval to be measured by said timing mechanism.

6. A device for softening cement bonding floor coverings to a floor surface comprising: a casing member having a pair of imperforate converging side walls interconnected by a pair of imperforate end walls and a transverse wall, the marginal edges of which are fixed to said side and end walls intermediate the normally upper and lower edges thereof; a plurality of sources of infra-red heat carried by said transverse wall and directing rays downwardly from said transverse wall; a plate element slidably mounted to the upper end of said casing member and forming a member adapted to close the upper end of said casing member; a rod slidably mounted to an end wall to extend substantially normal to the lower edge of said casing member; a timing mechanism carried by said casing; means interconnecting said rod and timing mechanism; said rod normally extending beyond the lower edge of said casing member and urged longitudinally by the placement of said casing member on a selected floor area, whereby said interconnecting means is moved to render said timing mechanism operative; and a signal means actuated by said timing mechanism for indicating the time interval following the placement of said casing member on the floor.

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