Feb. 18, 1936. J. K. CUSHMAN 2,030,969

SCRAPER BLADE

Filed June 17, 1932

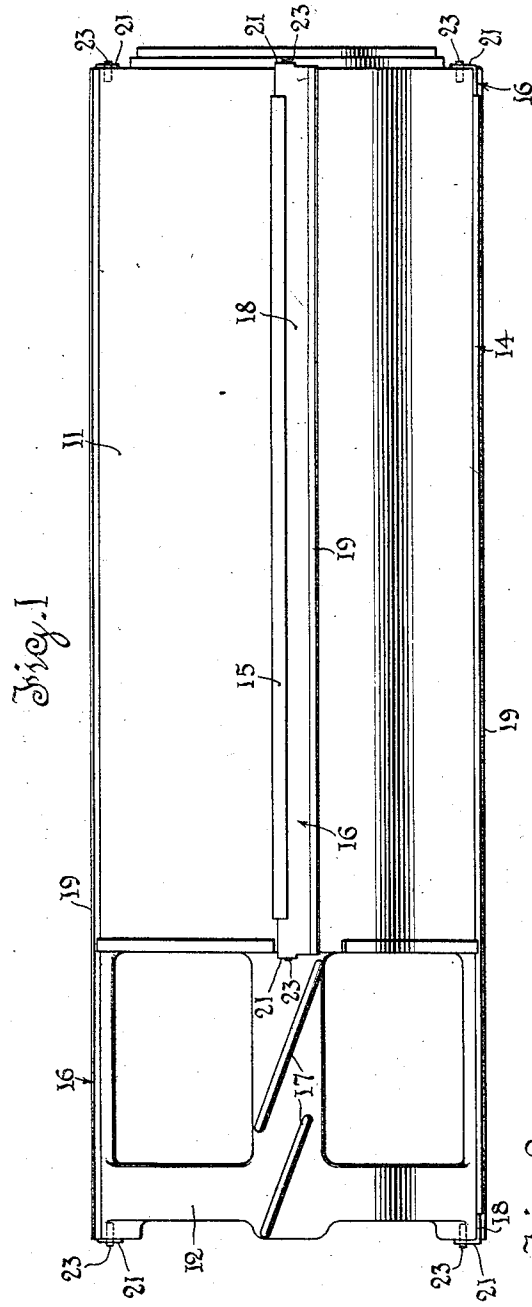


Fig. 1

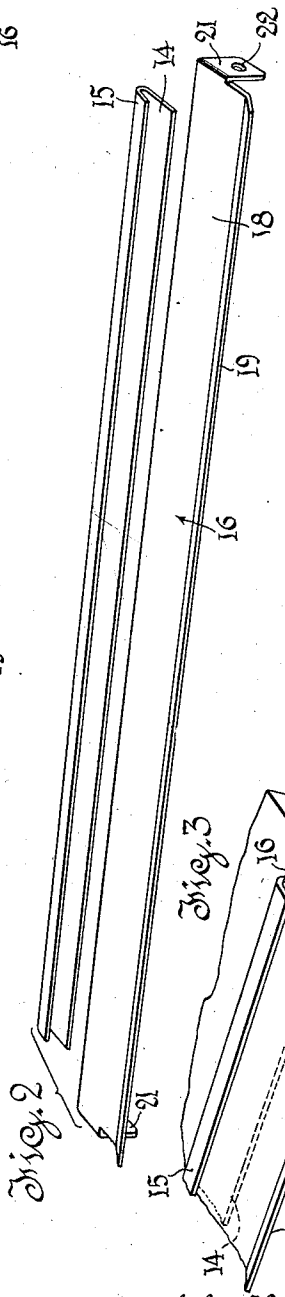


Fig. 2

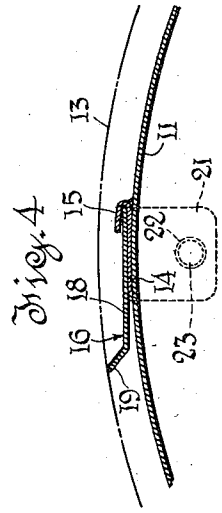


Fig. 4

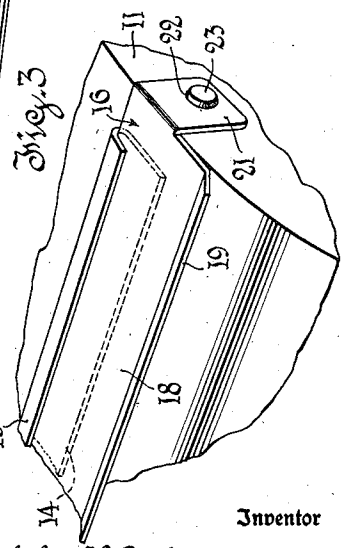


Fig. 3

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SCRAPER BLADE

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14 Claims. (Cl. 259—129)

This invention relates to scrapers, and particularly to means for supporting blades designed to scrape material from a surface having relative movement with respect to the blade.

The prime purpose of the invention is firmly to support the rear edge of a relatively flexible blade while permitting the leading edge to adjust itself to the surface being scraped.

It is also an object of the invention releasably to secure the blade to its carrier, whereby it may be removed for cleaning.

These and other objects will be apparent from the following description of one embodiment of the invention, taken in connection with the drawing, in which:—

Fig. 1 illustrates the application of the blade to a combined cylindrical shell and beater used in certain types of ice cream freezers;

Fig. 2 is a perspective view of the blade and rear edge support, the latter being shown as spaced from the blade for clarity;

Fig. 3 is a partial perspective, illustrating the manner in which the blade ends are secured to the carrier in the present embodiment; and

Fig. 4 is a partial sectional view of the blade and its support.

In the drawing, the blade carrier is shown as a cylinder 11, to one end of which is attached a beater frame 12. This type of carrier is rotatably mounted in a cylindrical freezing chamber, the wall 13 of which is indicated in Fig. 4.

Welded or otherwise secured to the carrier element are a plurality of sheet metal supports 14, one edge of each of the supports being reversely bent, as at 15, to form a channel to accommodate the rear edge of a scraper blade 16. As shown in Fig. 1, two of the blades and their supports extend the length of the combined cylinder and beater, while the other blades terminate at the ends of cylinder 11 so as not to interfere with the projecting vanes 17 on the beater frame.

The channel portion of the blade support is so formed that the rear edge of the blade fits loosely therein, thereby permitting relative movement or play between the support and the blade.

Blade 16 comprises a main flat portion 18 having its leading edge 19 bent angularly to the main portion and being provided with ears 21 at its ends. The ears are bent at right angles to the blade and have apertures 22 adapted to fit over lugs or pins 23 on the carrier. These lugs are slightly smaller in diameter than the apertures to permit limited relative movement therebetween. There is a rigid relation between the main portion of the blade and ears 21, but the ears are adapted to be sprung over lugs 23, and when the lugs enter apertures 22, the blade is so secured to the carrier that it has a limited swinging connection with channel 15.

In a practical application of the scraper to an ice cream freezer, for instance, the flat portion 16 of the blade is substantially tangential to the carrier element, and the leading portion is so bent as to contact the surface being scraped, that is, the wall of the freezing chamber, as shown in Fig. 4. It will be apparent that the rear edge of the blade is firmly supported, but that the leading edge readily adapts itself to the surface being scraped. The blade is relatively thin and springy so that the leading edge is forced against the wall of the freezing chamber by the frozen cream in front of the blade throughout its length.

When it is desired to remove the blade for cleaning, the ears are sprung over the holding lugs and the blade moved laterally to free it from channel 15. This may be done quickly. Reassembly is also effected with little effort. The blade and support, being formed from sheet metal, are easily bent to the desired forms, and are relatively inexpensive.

Since the leading portion of the blade is inclined to the wall of the freezing chamber in the direction in which the blade is moving and is relatively flexible, it is obvious that the edge of the blade is self-sharpening. The angle which the blade makes with respect to the wall being scraped is determined by the diameter of the cylindrical carrier in order that the proper sharpening effect be obtained. With this arrangement it is apparent that the wall is effectively scraped by the blade.

The form of carrier illustrated and described herein merely shows one application of the invention. It is obvious that it may be mounted on other forms of carrier and in apparatus other than ice cream freezers. It is also immaterial whether the scraper be movable or stationary, so long as it has relative movement to a surface to be scraped.

What is claimed is:—

1. The combination of, a carrier element; a scraper blade comprising a flat portion and a leading portion angularly disposed to the flat portion, said flat portion being bent at each end to form ears on the blade; a channel-shaped member on the carrier and cooperating with the rear edge of said flat portion throughout the length thereof to sustain the blade; and means for releasably securing said ears to said carrier.

2. The combination of, a carrier element; a

scraper blade comprising a flat portion and a leading portion angularly disposed to the flat portion, said flat portion being bent at each end to form ears on the blades, said ears being apertured; a channel-shaped member on the carrier and cooperating with the rear edge of said flat portion throughout the length thereof to hold said rear edge in substantially fixed relation to the carrier; and lugs on said carrier cooperating with said apertured ears for releasably securing the blade to the carrier.

3. The combination of a carrier element; a tiltable scraper blade; means on the carrier arranged releasably to engage and support said blade through substantially the entire length of its rear edge, said means being formed to permit tilting motion of the blade; and releasable means for attaching the ends of the blade to the carrier, said means serving to limit motion of the blade relatively to the carrier.

4. The combination of a carrier element having a flaring channel; and a flexible scraper blade having its rear edge engaged in said channel, the channel being substantially coextensive in length with said blade, said blade being tiltable about such rear edge while so engaged.

5. The combination of a carrier element having a channel; and a flexible scraper blade having its rear edge confined in and alined by said channel, throughout substantially the entire length of the blade, said channel permitting tilting motion of the blade about its rear edge.

6. The combination of a carrier element having a channel; a flexible scraper blade having its rear edge engaged in said channel, said blade being tiltable about such rear edge while so engaged; and resilient means including a portion integral with the blade, serving to retain the blade in coactive relation with said channel.

7. The combination of a carrier element having a flaring channel; a flexible scraper blade having its rear edge confined in and alined by said channel, throughout substantially the entire length of the blade, the flare of said channel offering clearance for tilting motion of the blade in the channel about its rear edge; and resilient means including a portion integral with the blade serving to retain the blade in coactive relation with said channel.

8. The combination of a carrier element having a channel; a flexible scraper blade having its rear edge engaged in said channel, said blade being tiltable about such rear edge while so engaged; detents on said carrier; and resilient tongues integral with said blade adapted to spring into lost motion engagement with said detents to retain the blade freely in coactive relation with said channel.

9. The combination of a carrier element having a channel; a flexible scraper blade having its rear edge confined in and alined by said channel, throughout substantially the entire length of the blade, said channel permitting tilting motion of the blade about its rear edge; detents on said carrier; and resilient tongues integral with said blade adapted to spring into lost motion engagement with said detents to retain the blade freely in coactive relation with said channel.

10. The combination of a carrier element having a flaring channel; a flexible scraper blade having its rear edge engaged in said channel throughout substantially the entire length of said edge, said blade being tiltable about such rear edge while so engaged; and releasable means for retaining said blade in said channel said means affording clearance for tilting motion of the blade.

11. The combination of a carrier element having a channel; a flexible scraper blade having its rear edge confined in and alined by said channel, throughout substantially the entire length of the blade, said channel permitting tilting motion of the blade about its rear edge; and releasable means for retaining said blade in said channel while permitting tilting motion thereof.

12. The combination of a carrier element having a flaring seat groove; a scraper blade mounted with its rear edge engaged throughout substantially its entire length in said groove, the flare of the groove being such as to permit tilting of the blade; and loosely fitting positively acting releasable detent means for retaining said blade in said groove.

13. In a device for scraping the surface of a wall, the combination of a carrier movable relatively to the wall and having a blade sustaining groove; and a flexible scraper angular in cross section and having its rear edge releasably and substantially continuously sustained in and alined by the groove in said carrier, and its leading edge inclined toward the wall to be scraped so as to enter into oblique engagement therewith whereby the scraper is sharpened by its rubbing contact with the wall.

14. The combination of a carrier element having a flaring seat groove; a scraper blade mounted with its rear edge engaged throughout substantially its entire length in said groove and fulcrumed within the groove, the flare of the groove being such as to permit tilting of the blade about its rear edge; and positively acting means for loosely retaining said blade in said groove.

JOHN K. CUSHMAN.