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(54) **Eraser system for stubborn, dry erase marks**

Löschvorrichtung für hartnäckige, trockene Markierungen nach einer ersten Löschung

Système pour effacer des marques tenaces, sèches provennant d'un premier effacement

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Description

[0001] This invention relates generally to erasers, and a combined eraser and marker product which comprise an eraser system. In all embodiments it relates specifically to an eraser which is especially adapted for erasing stubborn dry erase marks on white boards, the word "stubborn" being used herein to mean "difficult-to-remove".

BACKGROUND OF THE INVENTION

[0002] Dry markers used on white boards have become increasingly popular in recent years. Such markers are well developed and are currently available in a wide variety of colors, though black is the color most commonly used. Such markers are usually used in conjunction with dry erase boards which have a relatively smooth, non-porous surface so that the marker fluid does not sink into the body of the board to the same degree chalk sinks into a conventional slate blackboard. Such dry boards are also well-known in the art and hence a detailed description of the dry boards is not necessary to an understanding of the invention. Such boards are available in many colors but white is by far the most common color since it provides maximum or near maximum contrast with the marker fluid, particularly black fluid.

[0003] Although the marker and board described above are very popular, certain drawbacks have become apparent which pose a nuisance to users.

[0004] A significant problem is the fact that it is difficult to remove the markings made by such markers on a dry board if the markings have been on the dry board for a substantial length of time. It will be understood that dry board erasers are available which function very well in removing markings which are fresh from a dry board. Thus, for example, if a teacher uses the above-described marker and board to illustrate a lecture, the board may be covered with markings before the lecture is finished. When this occurs the lecturer simply erases the markings made earlier in the lecture using a conventional dry board eraser and thereby recreates a clear area on the board, and then begins to re-mark said clear area as the lecture continues. The markings made just moments ago, and other markings made up to a considerably longer period of time such as, for example, during the preceding lecture hour, erase easily with an eraser having a conventional dry board erasing surface. However, when the markings have been on the dry board for an extended period of time, say, for example, over a holiday or during a school closed period of several weeks or several months, the markings which remain from the last use can be removed using a conventional eraser only with great difficulty and with the application of repeated wiping passes under substantial hand-applied pressure. On occasion, even the application of the above-described effort does not result in a clear surface and hence the next user must work with a surface having faint, and possibly not so faint, traces of the markings made by a prior user. The possibility for confusion is obvious.

[0005] Prior markings which have been in place on a dry board for a substantial period of time are commonly referred to as stubborn dry erase marks, and that phrase will be used in this description and the accompanying claims to describe such markings.

SUMMARY OF THE INVENTION

[0006] The invention is directed to an eraser particularly well adapted to quickly and easily remove stubborn dry erase marks from marker boards while, at the same time, having the ability to quickly and easily remove fresh marks to the same extent as conventional erasers do. The invention is also directed to such an eraser which can be used by itself and without any accompanying components, and, equally well, to an eraser which can hold one or a plurality of markers so that the user can manipulate the eraser and the marker or markers as a unit, and change from one marker to another marker of different color quickly, thereby avoiding a disconcerting and attention-interrupting break in presentation by the dry board user.

[0007] The eraser in the (a) eraser, and (b) eraser and marker combination includes a first erasing medium which is particularly well adapted for removing recently applied markings from the dry erase board with which this invention is intended to be used, and a second erasing medium which is particularly well adapted to erase stubborn dry erase marks. Although different materials may be used for each of the above-described erasing mediums, it is preferred that the first erasing medium be a pile fabric, and the second erasing medium be velcro, and preferably a closed loop velcro.

[0008] It is also a feature of the invention that the eraser framework be so arranged that it may be conveniently grasped by a user when no markers are associated with the eraser, and equally easily grasped by a user when one on up to the full storage capacity of the eraser are assembled to the eraser.

[0009] The invention starts from US-A-1 928 230, on which the preamble of claim 1 is based, and achieves its aim by virtue of the characterising features of that claim. Preferred features are set forth in the subsidiary claims.

DESCRIPTION OF THE DRAWING

[0010] The invention is illustrated more or less diagrammatically in the accompanying drawing in which:

Figure 1 is a perspective view of the eraser system for stubborn dry eraser marks of this invention with, in this instance, three markers associated therewith;

Figure 2 is a right end view;

Figure 3 is an end view of the eraser; and

Figure 4 is a bottom view of the eraser;

DESCRIPTION OF A SPECIFIC EMBODIMENT

[0011] Like reference numerals will be used to refer to like or similar components from Figure to Figure in the drawing.

[0012] The eraser system of this invention is indicated generally at 10 in Figures 1 and 2. The eraser consists essentially of two parts, a framework, indicated generally at 11 in Figures 1, 2 and 3, and the erasing medium, indicated generally at 12 in the Figures.

[0013] The framework 11 is, in this instance, a unitary piece having constant dimensions from end to end so that it lends itself to economical production processes, such as plastic extrusion techniques.

[0014] The lower portion of framework 11 has three distinct sections comprising a center section 14 and two side sections 15 and 16 which are illustrated best in Figures 1, 2 and 3. As best seen in Figure 3, the two side sections 15 and 16 are disposed at the same level and the center section 14 is offset downwardly therefrom by means of upwardly and outwardly inclined wall portions 17 and 18. The lower portion forms, in effect, a base to which the erasing medium is secured.

[0015] The erasing medium consists of two strips of pile fabric, indicated at 19, 20, of a width which conforms to and depends downwardly from the securement areas 21, 22 formed on the undersurface of side sections 15, 16 respectively. The strips of pile fabric are secured to their associated surfaces by a carrier indicated at 23, 24 respectively. Preferably the carrier is an adhesive having the property of being able to form a bond strong enough to withstand the substantial pressures to which the eraser is subjected when in use throughout the entire useful life of the eraser, and capable of forming such a bond with both the material of which the framework is composed, which is preferably plastic, and the conventional pile fabric backing. The pile fabric may for example be polypropylene fabric in the form which is used in carpeting and other products such as paint rollers. One suitable carrier material is a clear adhesive available from the 3M Company under the trade designation 8056 Adhesive Systems. Said carrier is applied in an amount to form a strong bond and may for example have a thickness of on the order of about 0.79 mm (1/32 inch). The pile fabric may, for example, have a thickness of on the order of about 6.35 mm (1/4 inch).

[0016] The erasing medium further includes a strip 26 of the plastic material commonly known as velcro. Both cut loop and closed loop velcro is available but the closed loop form is used because of its stiffness and better mark removing capability. The velcro is attached to the undersurface of the center section 14 of the framework by a suitable carrier, indicated at 27, which carrier may be the same as the carrier material 23, 24 since velcro is a plastic material.

[0017] From Figures 2 and 3 it will be noted that the pile fabric preferably extends downwardly a short distance further than the velcro, said distance being, for example, on the order of about 0.79 mm (1/32 inch).

[0018] The upper portion of the framework has roughly the shape of the letter Y and consists of a vertical stem 28 and two diverging arm portions 29, 30 which diverge (or join) at junction 31. Each arm portion terminates in an upwardly and outwardly inclined wall 32, 33, each wall forming a sharp junction with its associated arm at 34, 35, respectively for a purpose which will appear hereinafter. It will be noted that that portion of the arm portions 29, 30 which are closely adjacent to their associated walls 32, 33 are formed with a slight reverse curve so that the arm-wall junctions 34, 35 are closer to the upper surface of their associated side sections 15, 16 than the area immediately inwardly from said arm-wall junctions 34, 35.

[0019] Each wall 32, 33 terminates in an inwardly extending section 37, 38 which, in this instance, is horizontally disposed. Each inwardly extending section 37, 38 in turn terminates in a downwardly extending edge lip 39, 40 though this specific configuration may be varied as will appear hereinafter.

[0020] Since the entire framework is formed of plastic and the thickness of the various components may be only on the order of about 1.58 mm (1/16 inch), it will be appreciated that the components, though fixed in position to one another in an unstressed condition, are not absolutely rigid. Specifically, they have the capability of flexing to a slight degree toward and away from one another under urging in a deforming direction by modest hand applied pressure. The plastic material from which the framework is composed has a memory so that once deformed by external pressure the components will tend to return to their initial, unstressed position.

[0021] Referring now to Figures 1 and 2, and initially to Figure 2, the combination of an eraser and a maximum of three markers are shown. As can be best appreciated from Figure 2, any one or all of markers 44, 45 or 46, or any combination thereof, may be assembled to the framework 11 to thereby form a combined eraser-marker system 10. The exact configuration of the markers is not an essential feature of the invention so long as at least one lineal area is capable of being assembled to the eraser.

[0022] In order to enable a marker to be received and securely held to the framework 11, certain spatial relationships must be present.

[0023] Specifically, to hold marker 45 between the upper surface of the left side section 15 of the bottom of the framework and left arm 29 of the Y section of the framework, the distance between left arm-wall junction 34 and the upper surface of left side section 15 will be

slightly shorter than the vertical diameter of the marker 45. Since the vertical distance between arm-wall junction 34 and left side section 15 lies to the left of the vertical diameter of marker 45 and said vertical distance is less than the vertical distance of marker 45, the marker 45 will be positively mechanically gripped between the Y section and the left side section 15 of the framework. In effect, at least a three point support for the marker has been provided with at least two of the three support or contact points between the framework and the marker lying on opposite sides of a diametrical line of the marker, with at least one contact point on each side of the diametrical line.

[0024] Similar functions exist with respect to the right side of the eraser when marker 46 is inserted in its indicated position. In essence, the inherent resiliency of the plastic material from which the Y arm portions 29, 30 are formed enable said Y arms 29, 30, to swing upwardly toward a 12:00 position whenever a marker is inserted in the pocket area formed between the underside of a Y arm 29, 30 and the upper side of a side section 15, 16.

[0025] When a marker 44 is inserted into the top center of the Y section above junction 31, the planar walls 32, 33 will flex outwardly to thereby allow the marker 44 to pass through the horizontal space between edge lips 39, 40 until the marker abuts the upper inside surface of Y arm portions 29, 30 as illustrated in Figure 2. Since the distance between the contact points of the edge lips 39, 40 is less than the horizontal diameter of marker 44, and since said distance is above said horizontal diameter, the marker will be positively, mechanically gripped by the super structure defined by walls 32, 33, inner wall sections 37, 38 and edge lips 39, 40. It will be understood that when three markers are assembled to the framework 11, the inwardly extending sections 37, 38 will be sprung slightly upwardly as well as outwardly.

[0026] Referring now to Figure 1, a specific example of a marker of a definite configuration is there illustrated. In this showing the markers indicated generally at 44, 45 and 46 are each formed with a main cylindrical portion 47 of constant diameter which terminates at one end in a short section of reduced diameter 48 which abuts against a cap 49. The maximum diameter of cap 49 is shown, in this instance, as equal to the diameter of the cylindrical portion 47 and hence the maximum diametrical area of the cap deflects the Y portion of the framework to the same extent and in the same manner as does the cylindrical portion 47. However, it will be appreciated that it is possible that the maximum diameter of the cap may be larger or smaller than the diameter of the main cylindrical section 47. If the cap has a maximum diameter larger than the diameter of cylindrical portion 47, the only, or primary, holding force between the framework and the marker or markers will occur at the contact points between the framework and said maximum diameter of the cap. If the cap has a maximum diameter smaller than the cylindrical portion 47, the primary, and probably only, holding force between the framework and marker or markers will occur between the cylindrical portion 47 and the framework.

[0027] It will thus be seen that the eraser structure is very flexible in terms of accommodating markers of different lengths and exterior configurations.

[0028] In use, a user grasps the framework of the eraser together with either one, two or three markers, if present, in one hand and wipes the dry board containing markings with the usual arm-hand generated strokes.

[0029] The pile fabric strips 19, 20 will effectively remove markings which have not dried so long and so hard as to be characterized as stubborn dry erase marks. The exposed surface of velcro strip 26 may make contact with the dry erase board and contribute to the erasing action, but the primary mark erasing portion of the eraser system will be the pile fabric strips 19, 20; indeed, they may remove all the non-stubborn markings. In essence, the velcro strip need not be fully activated if no stubborn dry erase marks are to be removed, with the phrase not fully activated including all degrees of activation from no activation up to nearly complete activation.

[0030] When stubborn dry erase markings are encountered the user applies sufficient pressure to cause the velcro strip 26 to come into contact with the dry erase board. Since the individual loops which form the velcro strip are much stiffer and harder than the soft, carpet-like consistency of the pile fabric strips 19, 20, the pile fabric strips will be readily compressed and, at their edges, forced outwardly so that the coarse, harder velcro fibers readily engage the board's surface. As a consequence, the heavier scraping action derived from the velcro loops will be applied instantly to the board to bring maximum scrubbing/erasing pressure to bear on the stubborn dry erase marks. Any marking material which is dislodged from the surface of the dry erase board and which is not picked up by the velcro will be trapped by the softer, pile fabric strips 19, 20.

[0031] It will thus be seen that an eraser system, and specifically an eraser or an eraser in combination with one or a plurality of markers, has been disclosed which functions to effectively remove both recently applied markings on dry erase boards and stubborn dry erase markings.

[0032] Although a specific embodiment of the invention has been illustrated and described, it will at once be apparent to those skilled in the art that various modifications and variations may be made within the scope of the claims. Accordingly, it is intended that the scope of the invention be limited solely by the hereafter appended claims when interpreted in light of the relevant prior art, and not according to the specific disclosures set forth hereinabove.

Claims

1. An eraser (10) for erasing difficult-to-remove dry erase marks, said eraser including a framework (11) having a base portion (14) which carries erasing media (19, 20; 26),

   said framework (11) further including a portion (28, 29, 30) projecting upwardly from the base portion (14) and contoured to be grasped in the hand of the user, and
   the erasing media being carried by the underside of the base portion (14),
   said erasing media including a first erasing medium (19,20) of soft flexible material which is capable of removing and holding marking fluid which has recently been applied to a marking surface and a second erasing medium (26) which is harder and stiffer than said first erasing medium and is capable of erasing difficult-to-remove dry erase marks, characterized in that the first erasing medium (19-20) is a pile fabric, while the second erasing medium (26) is a hook and/or loop material.

2. The eraser of claim 1, further characterized in that the second erasing medium (26) is a closed loop material.

3. The eraser of claim 1 or claim 2, characterized in that the upwardly-projecting portion (28, 29, 30) of the framework (11) is less wide than the base portion (14).

4. The eraser of claim 1, further characterized in that said second erasing medium (26) is located between separate areas (19,20) of said first erasing medium.

5. The eraser of any one of claims 1-4 further characterized in that said first erasing medium (19-20), in an inoperative unstressed condition, extends downwardly from the underside of the base portion (14) of the framework (11) a slightly greater distance than the second erasing medium (26) whereby, if only said first, soft erasing medium (19,20) is required to remove markings, said second erasing medium (26) need not be fully activated.

6. The eraser of any one of claims 1-5, characterized in that said upwardly-projecting portion (28, 29, 30) of the framework (11) has space for receiving and holding at least one marker (44, 45 or 46) whereby the eraser and marker can be grasped and used as a unitary structure.

7. The eraser of claim 6 further characterized in that the upwardly-projecting portion (28, 29, 30) is generally Y-shaped, at least one arm portion (29,30) of the Y overlying on side of the base portion (14), the underside of the said one arm portion and the base portion being contoured to make contact with a marker assembled thereto at at least three contact points, at least two of which lie on opposite sides of a diametrical line of the marker.

8. The eraser of claim 7 further characterized in that each arm portion (29,30) of the Y overlies an associated side of the base portion (14), the underside of each arm portion and its associated side of the base portion being contoured to make contact with a marker assembled thereto at at least three contact points, at least two of which lie in opposite sides of a diametrical line of the marker.

9. The eraser system of claim 8 further characterized in that the arm portions (29,30) of the Y form a seat for the reception of a third marker, and means (37,38) are provided for positively mechanically gripping the third marker.

10. The eraser of claim 9 further characterized in that the framework (11) is a unitary, one-piece structure formed from a solid flexible material which may be slightly resiliently deformed when a marker is assembled thereto.

Patentansprüche

1. Löscher (10) zum Löschen von schwer entfernbarer, trocken zu löschender Schrift bzw. Markierung, wobei der Löscher einen Rahmen (11) mit einem Unterteil (14) aufweist, welches Löschmittel (19,20;26) trägt,

   wobei der Rahmen (11) weiterhin einen Teil (28,29,30) umfaßt, der sich vom Unterteil (14) aufwärts erstreckt und zum Halten in der Hand des Benutzers profiliert ist, und
   die Löschmittel von der Unterseite des Unterteils (14) gehalten werden,
   wobei die Löschmittel ein erstes Löschmittel (19,20) aus weichem, flexiblem Material, das in der Lage ist, Beschriftungs-Flüssigkeit, die kurz zuvor auf eine Beschriftungs-Oberfläche aufgebracht wurde, zu entfernen und zu halten, und ein zweites Löschmittel (26) umfassen, welches härter und steifer als das erste Löschmittel und in der Lage ist, schwer entfernbare Trockenlösch-Beschriftungen zu entfernen, dadurch gekennzeichnet, daß das erste Löschmittel (19-20) ein flauschiges Textilmaterial ist, während das zweite Löschmittel (26) ein mit Haken und/oder Schlaufen versehenes Material ist.

2. Löscher nach Anspruch 1, weiterhin dadurch gekennzeichnet, daß das zweite Löschmittel (26) ein Material mit geschlossenen Schlaufen ist.

3. Löscher nach Anspruch 1 oder 2, dadurch gekennzeichnet, daß der sich aufwärts erstreckende Teil (28,29,30) des Rahmens (11) weniger breit als das Unterteil (14) ist.

4. Löscher nach Anspruch 1, weiterhin dadurch gekennzeichnet, daß das zweite Löschmittel (26) zwischen getrennten Bereichen (19,20) des ersten Löschmittels angeordnet ist.

5. Löscher nach einem der Ansprüche 1 bis 4, weiterhin dadurch gekennzeichnet, daß sich das erste Löschmittel (19-20) in belastungsfreiem, betriebsfreiem Zustand von der Unterseite des Unterteils (14) des Rahmens (11) mit einem geringfügig größeren Abstand als das zweite Löschmittel (26) nach unten erstreckt, wodurch dann, wenn nur das erste, weiche Löschmittel (19,20) zur Entfernung einer Beschriftung benötigt wird, das zweite Löschmittel (26) nicht vollständig aktiviert werden muß.

6. Löscher nach einem beliebigen der Ansprüche 1 bis 5, dadurch gekennzeichnet, daß der sich nach oben erstreckende Teil (28,29,30) des Rahmens (11) Raum für die Aufnahme und das Halten mindestens eines Stiftes (44,45 oder 46) besitzt, wodurch Löscher und Stift als einheitliche Struktur gegriffen und verwendet werden können.

7. Löscher nach Anspruch 6, weiterhin dadurch gekennzeichnet, daß der sich nach oben erstrekkende Teil (28,29,30) im allgemeinen Y-förmig ausgebildet ist, wobei mindestens ein Armteil (29,30) des Y über eine Seite des Unterteils (14) ragt, wobei die Unterseite dieses Armteils und das Unterteil so profiliert sind, daß sie mit einem hierzu hinzugefügten Stift an mindestens drei Kontaktpunkten in Kontakt treten, von denen mindestens zwei an gegenüberliegenden Seiten einer diametralen Linie des Stiftes liegen.

8. Löscher nach Anspruch 7, weiterhin dadurch gekennzeichnet, daß jeder Armteil (29,30) des Y über eine zugehörige Seite des Unterteils (14) ragt, wobei die Unterseite jedes Armteils und die ihr zugeordnete Seite des Unterteils so profiliert sind, daß sie mit einem hierzu hinzugefügten Stift an mindestens drei Kontaktpunkten in Kontakt treten, von denen mindestens zwei an gegenüberliegenden Seiten einer diametralen Linie des Stiftes liegen.

9. Löschsystem nach Anspruch 8, weiterhin dadurch gekennzeichnet, daß der Armteil (29,30) des Y einen Sitz für die Aufnahme eines dritten Stiftes bildet, und Mittel (37,38) für ein formschlüssiges selbsttätiges Halten des dritten Stiftes vorgesehen sind.

10. Löscher nach Anspruch 9, weiterhin dadurch gekennzeichnet, daß der Rahmen (11) eine einheitliche, aus einem Stück bestehende Struktur ist, die aus einem festen, biegbaren Material gebildet ist, das geringfügig elastisch deformiert werden kann, wenn ein Stift hinzugefügt wird.

Revendications

1. Un effaceur (10) pour effacer des marques sèches difficiles à éliminer, ledit effaceur comprenant un cadre (11) ayant une partie de base (14) qui supporte des milieux d'effacement (19, 20; 26),

   ledit cadre (11) comprenant en outre une partie (28, 29, 30), faisant saillie vers le haut de la partie de base (14) et profilée de façon à être saisie dans la main de l'utilisateur, et
   les milieux d'effacement étant supportés par la face inférieure de la partie de base (14),
   lesdits milieux d'effacement comprenant un premier milieu d'effacement (19, 20) constitué d'un matériau flexible souple, qui peut éliminer et maintenir un fluide de marquage qui a été récemment appliqué sur une surface de marquage, et un deuxième milieu d'effacement (26) qui est plus dur et plus rigide que ledit premier milieu d'effacement et peut effacer les marques d'effacement sèches difficiles à éliminer, caractérisé par le fait que le premier milieu d'effacement (19-20) est un tissu velouté, tandis que le deuxième milieu d'effacement (26) est un matériau à crochets et/ou à boucles.

2. L'effaceur selon la revendication 1, caractérisé en outre par le fait que le deuxième milieu d'effacement (26) un matériau à boucles fermées.

3. L'effaceur selon la revendication 1 ou la revendication 2, caractérisé par le fait que la partie (28, 29, 30) saillant vers le haut du cadre (11) est moins large que la partie de base (14).

4. L'effaceur selon la revendication 1, caractérisé en outre par le fait que ledit deuxième milieu d'effacement (26) est placé entre des zones (19, 20) séparées dudit premier milieu d'effacement.

5. L'effaceur selon l'une quelconque des revendications 1-4, caractérisé en outre par le fait que ledit premier milieu d'effacement (19-20), dans un état non-sollicité inopérant, s'étend vers le bas depuis la face inférieure de la partie de base (14) du cadre

(11), à une distance légèrement plus grande que le deuxième milieu d'effacement (26), de manière que, si seule ledit premier milieu d'effacement (19, 20) souple est nécessaire pour éliminer les marques, ledit deuxième milieu d'effacement (26) ne nécessite pas d'être complètement activé.

6. L'effaceur selon l'une quelconque des revendications 1-5, caractérisé par le fait que ladite partie (28, 29, 30) saillant vers le haut du cadre (11) présente un espace destiné à recevoir et à maintenir au moins un marqueur (44, 45 ou 46), de manière que l'effaceur et le marqueur puissent être saisis et utilisés sous la forme d'une structure monobloc.

7. L'effaceur selon la revendication 6, caractérisé en outre par le fait que la partie (28, 29, 30) faisant saillie vers le haut est globalement en forme de Y, au moins une partie de bras (29, 30) du Y recouvrant un côté de la partie de base (14), la face inférieure de ladite première partie de bras et la partie de base étant profilées pour établir un contact avec un marqueur leur étant assemblé, en au moins trois points de contact, dont au moins deux d'entre eux se situent sur les côtés opposés d'une ligne diamétrale du marqueur.

8. L'effaceur selon la revendication 7, caractérisé en outre par le fait que chaque partie de bras (29, 30) du Y recouvre un côté associé de la partie de base (14), la face inférieure de chaque partie de bras et son côté associé de la partie de base étant profilés pour établir un contact avec un marqueur leur assemblé en au moins trois points de contact, au moins deux d'entre eux se trouvant sur les côtés opposés d'une ligne diamétrale du marqueur.

9. Le système d'effaceur selon la revendication 8, caractérisé en outre par le fait que les parties de bras (29, 30) du Y forment un siège pour recevoir un troisième marqueur et des moyens (37, 38) sont prévus pour saisir positivement mécaniquement le troisième marqueur.

10. L'effaceur selon la revendication 9, caractérisé en outre par le fait que le cadre (11) est une structure monobloc unitaire formée à partir d'un matériau flexible massif qui peut être légèrement déformé élastiquement lorsqu'un marqueur lui est assemblé.

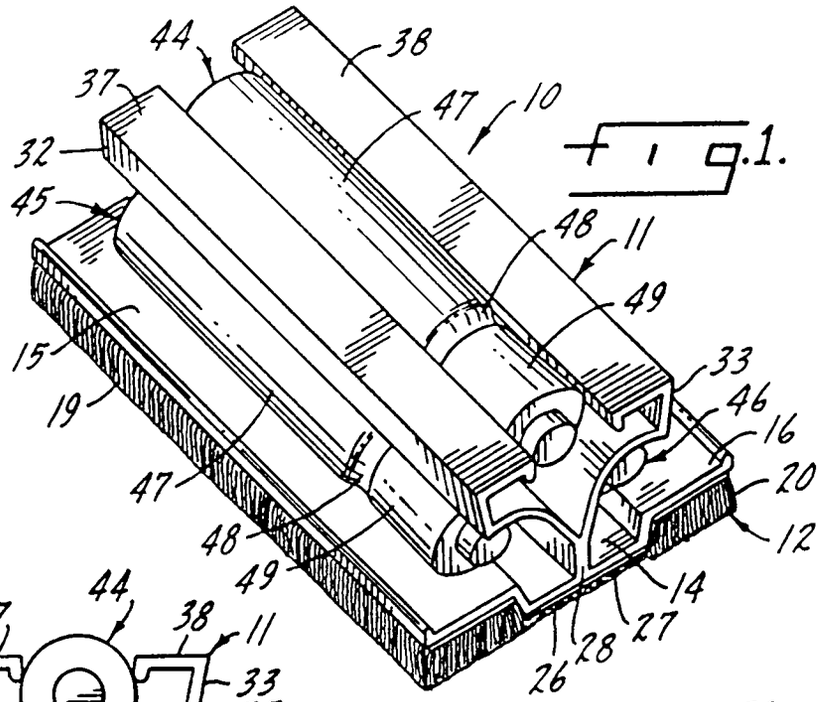

Fig.1.

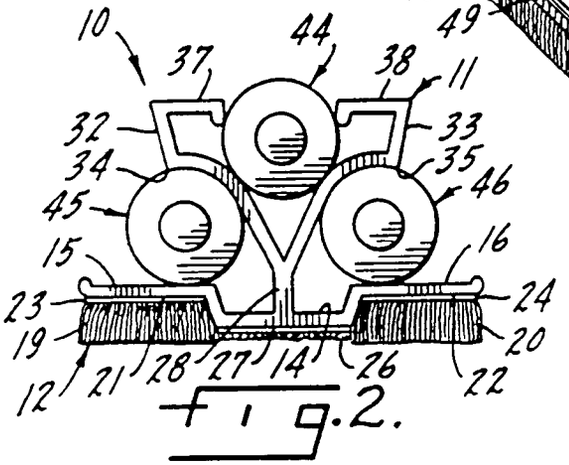

Fig.2.

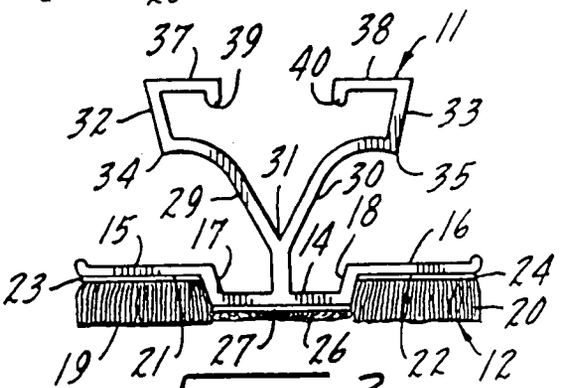

Fig.3.

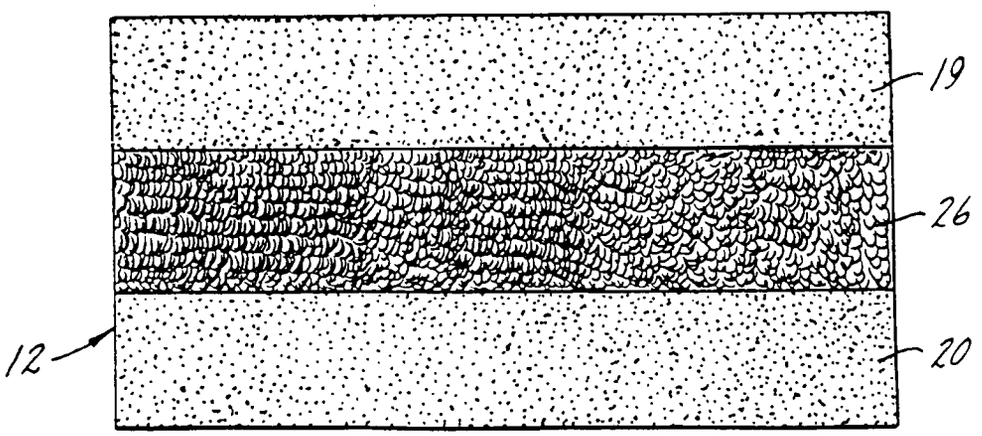

Fig.4.