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DEVICE FOR PREVENTING COLIC IN FEEDING INFANTS

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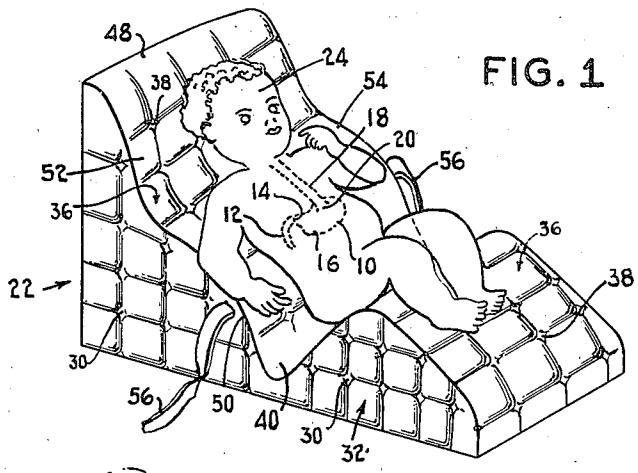


FIG. 1

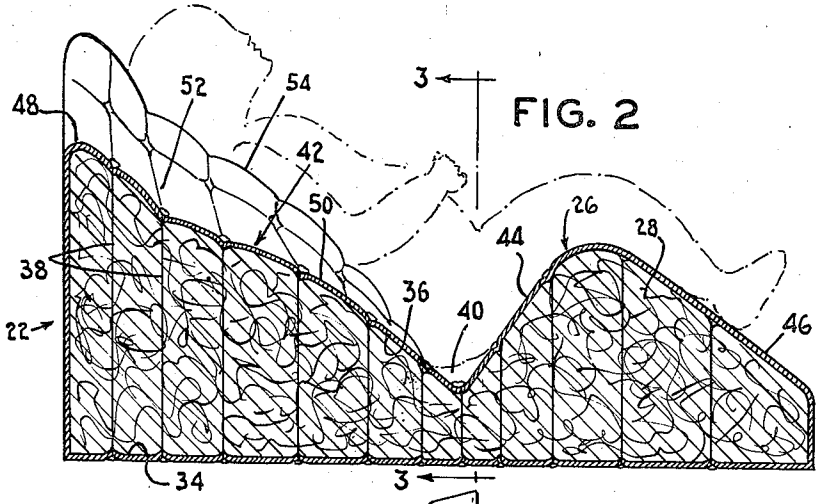


FIG. 2

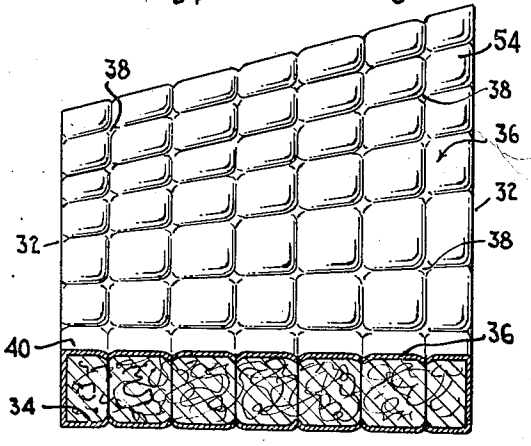


FIG. 3

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DEVICE FOR PREVENTING COLIC IN FEEDING INFANTS

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4 Claims. (Cl. 5—327)

This invention relates to a device for preventing colic in feeding infants.

Extended investigation of the factors entering into the occurrence of colic in infants has resulted in fixing certain premises. The physiology of the stomach, especially in regard to the relationship of the entrance of the esophagus to the stomach, and the outlet to the pylorus from the stomach, indicates certain possibilities which have been supported by X-ray examinations of infants while they are being fed with radio-opaque material.

It was found that the feeding position, in which infants customarily are positioned when being fed from a bottle, is one in which the entrance from the esophagus to the stomach is actually below the outlet from the stomach by way of the pylorus. Air, trapped with the food while it is being eaten, enters the stomach, and naturally will rise. Where the infant is positioned as just described, the air, in rising, will be moving away from the vent provided by the esophagus, and will be moving towards the unintended and undesirable outlet from the stomach to the intestines by way of the pylorus.

Thus gas, which is an undesirable element in the intestines, may enter the small intestine and result in severe pain to the infant unless eliminated in some manner. The air can, by constant overseeing, and by repeated interruptions during the feeding, be caused to vent back from the stomach through the esophagus. At these interruptions, the infant is held upright for a few moments, but, as a general rule, the damage has been done during the incorrect position by passage of air to the intestine, and relief comes only after considerable pain to the infant, and, in some cases, only after actual vomiting, as the gas pressure becomes sufficiently positive to eject food from the stomach, through the esophagus, and out through the mouth.

Experimentation with a large number of infants who, prior to examination, had been distressed by colic, resulted in the observation that, if the body of the infant were disposed to maintain, constantly throughout feeding, a particular angular relation to the horizontal, feeding of the infant could be carried on continuously without any interruption, and yet the infant would not suffer from air trapped with its food. The position has to be such that an infant, which may be so young as not to be capable of assisting itself in maintaining the desired position, may be supported properly against sliding downwardly and sideways. Too much weight should not be supported by the buttocks, as such an infant may not have become developed sufficiently to be able to sustain such a concentrated load. At the same time, the support must be one which will assure that the body of the infant will continuously be maintained in such position that the opening of the esophagus into the stomach shall be at a point higher than the point of the opening of the pylorus into the stomach, and also so that the body will be disposed so that liquid in the stomach may not form, with the walls of the stomach, a pocket at the corner of the stomach at which the pylorus opens thereinto. The positioning of the body must be such that this corner will be disposed to open continuously upwardly, so that air may not be trapped in that corner, but will travel towards the opening of the esophagus into the stomach.

It is an object of the invention to provide, for the body of an infant, means for maintaining the body in a reclining position wherein a substantial portion of the weight of the body will be supported by the back of the torso as well as by the buttocks, and wherein the body will be so retained as to restrain it from sliding relatively to the support. The angular position is predeterminedly one in which the stomach will be disposed so that no pocket may be formed in the stomach by the liquid contained therein, except at the esophagus, and so that the opening of the pylorus into the stomach will be at a point lower than the opening of the esophagus into the stomach. Experimentation has resulted in the determination of the angle at which the body of the infant should be maintained as about 60° to the horizontal. In this position, air swallowed with the food will not be trapped in the distal portion of the stomach, that is, the portion from which the pylorus leaves; such air will rise naturally through the esophagus, and not pass, either under pressure or otherwise, into the small intestines.

The support may be so shaped as to require the conformation of the dorsum of the torso in such manner that the torso will be slightly hyperextended. The effect of this is that the stomach is not under pressure, and may fill to capacity with food, the gases being caused to exit through the esophagus, and not to pass to the small intestine. By causing the gases thus to move oppositely from movement towards the intestine, compression of the abdomen is relieved so that not only will colic be prevented but, in fact, vomiting, which may follow from back pressure of the gases in the small intestine, is eliminated. At the same time, the stomach is permitted to fill properly so that digestion may proceed without interruption.

Observation has shown that the esophagus enters the stomach, not on the medial line of the body, nor does the pylorus leave the stomach on such line. The esophagus and the pylorus are associated with the stomach on opposite sides, the former being to the left, and the latter, to the right, of the medial line.

It is an object of the invention to dispose the

body during feeding, and as it remains positioned on a support, so that the section immediately associated with the esophagus will be higher than the section of the stomach at the pylorus. For this purpose, it has been found that, properly to shape the support to obtain this result in addition to the disposition of the body angularly to the horizontal, the support cooperates with the body of the infant so that the body may be disposed as if it were resting slightly on its side, with the infant turned slightly to the right so that the left side of the infant is raised. The angle to which the body is turned relatively to the plane of the support was found to be, for greatest effect, about 10°.

Other objects of this invention will hereinafter be set forth, or will be apparent from the description and the drawing, in which is illustrated an embodiment of apparatus for carrying out the invention.

The invention, however, is not intended to be restricted to a particular construction or arrangement of parts, nor to particular applications of such a construction, nor to specific methods of use, nor to various details thereof, herein shown and described, as the same may be modified in various particulars, or be applied in many varied relations, without departing from the spirit and scope of the invention, a practical embodiment of which has been illustrated and described herein without attempting to show all the various forms and modifications in which the invention might be embodied.

On the drawing, in which the same reference characters refer to the same parts throughout, and in which is disclosed such practical embodiment:

Fig. 1 is a perspective view, in elevation, of the device embodying features of the invention, an infant being illustrated as positioned thereon, and a portion of the vital organs being shown in dotted lines to illustrate the relative arrangement thereof in the use of the device;

Fig. 2 is a vertical sectional view, taken longitudinally of the device shown in Fig. 1, the infant being shown in dot-and-dash lines, to illustrate the relative position of the infant to the device and the internal construction of the device; and

Fig. 3 is a transverse vertical sectional view, substantially on the line 3—3 of Fig. 2, to illustrate the raising of one portion of the supporting surface.

As shown by the illustrative sketch of Fig. 1, the stomach 10 of such an infant is disposed so that the pylorus 12 does not have its opening 14 into the stomach at the very lowermost portion of the stomach, when the body is in either an upright position or in a completely horizontal position. Opening 14 is associated with a pocket 16 which, when the stomach contains liquid and as the body is turned from the vertical to the horizontal, may become segregated as a distinct chamber bounded by the liquid level as one wall. Thus air trapped in this chamber, as shown in Fig. 1, by the very pressure of the food entering the stomach from the esophagus 18 at opening 20, will be forced into the pylorus and then into the small intestine. As can be seen from Fig. 1, openings 14 and 20 are located at opposite sides of the vertical axis of the body.

For the purpose of the invention, a device 22 has been so designed and so constructed that an infant 24, reposing thereon, will have its digestive organs located in such relationship that food, taken in through the mouth, will necessarily be gravitated into stomach 10 through esophagus 18, while air in the stomach, or trapped with the food, will have free and easy passage back up the esophagus, and not into the pylorus. The device may be manufactured by any suitable process, and may be designed as a cushioning member having any desired covering material 26. In view of the use to which such devices are to be put, it is preferable that material 26 be waterproof, and yet comfortable for the infant reclining thereon. The device may have any desired filling material 28 housed within the contours defined by covering material 26, which may be shaped by tufting 30 to define walls 32, between which a bottom 34 and a reclining surface 36 are defined for the device. Suitable tufting 38 may bind bottom 34 and surface 36 into properly associated relationship.

Surface 36 may be shaped to include a hollow 40 defined by rising sections 42 and 44. This hollow is intended to receive the buttocks of the infant so that the legs of the infant may hang over, or rest upon a downgrade section 46. In this fashion, the infant is comfortably supported against any sliding movement down the incline of surface 36. At the same time, the legs of the infant are properly supported on section 46 so that no distress will be encountered by reason of this position.

Section 42 extends upwardly substantially to top edge 48 of the device. Intermediately of section 42, at 50, surface 36 is slightly convexed outwardly. As shown on the drawing, this convexed portion 50 is intended to fit into the hollow of the back of the infant, and thus serves to force the torso, at that point, outwardly, or to extend the torso. As convexed portion 50, and the distention resulting from its engagement with the torso, is in the neighborhood of the intestines, there results necessarily that the intestines be placed under slight pressure. The stomach, above the intestines, is beyond the region of engagement of portion 50, and is thus not under pressure, but is left free to fill as the infant is fed.

A slight hollow 52 may be defined in surface 36 just above convexed portion 50, by suitable tufting, to provide a rest for the head of the infant during feeding. When the infant is reposing upon the device, the entire body of the infant is disposed in a position at an angle to the horizontal, and, by the shaping of this device, will so be maintained normally. It has been found desirable that the average inclination of surface 36, that is, particularly that of section 42, be about 60° to the horizontal. With the body of the infant maintained in this angular position, it has been found that opening 20 to the stomach of esophagus 18 is at a higher level than opening 14 at the exit of the pylorus from the stomach. This is effected while the infant is supported so that a large part of its weight is transmitted through its dorsum, and only a small portion of the load will be carried by the buttocks at hollow 40.

Further to effect the desired result of providing a free passage for gases trapped in the stomach, it was found desirable to change the contouring of surface 36 in section 42 to produce a distinct lift in one side of the body. This side is determined by the fact that opening 20 of the esophagus into the stomach is to the left of the medial line of the body, while opening 14 of the pylorus from the stomach is to the right of that line. A

portion 54 of section 42, as shown in Figs. 2 and 3, is inclined to surface 36 so that the body of the infant would be turned away from a position in which a line, say across the shoulders, or other similar transverse lines across the body, are substantially parallel to bottom 34. By this construction, opening 20 is raised even further away from opening 14. An angle of 10° for portion 54 with relation to surface 36 was found effective for this purpose.

While the device has been described as made with tufting, it is, of course, possible to construct a device in accordance with the invention in many other ways, as, for instance, by using an inflatable member. Also, if desired, a belt 56 may be attached to the device in order to prevent side sliding of the body. In one suitable construction, a pair of arms were provided at walls 32 to form guards for insuring that the infant should not roll off the device when unattended.

Many other changes could be effected in the particular apparatus designed, and in the methods of use set forth, and in specific details thereof, without substantially departing from the invention hereof intended to be defined in the claims, the specific description herein being merely to illustrate an operative embodiment for carrying out the spirit of the invention.

What is claimed as new and useful is:

1. A device for preventing colic in infants as a result of the manner of feeding, which comprises a posture-defining support for the entire body of the infant, the support being constructed to fix the position of the body of the infant during feeding so that gases formed or trapped by the food entering the stomach will be provided a continuously maintained exit to the esophagus and not to the pylorus, the support comprising a base, and being shaped to provide a substantially horizontally disposed trough above the base and extending from side to side of the base, the trough providing means for receiving and retaining the buttocks of an infant, the trough including a wall extending upwardly from the trough into a surface to provide a rest for the dorsum of the infant, the surface extending from side to side of the base and being disposed at an angle of approximately 60° to the horizontal in its extent from the wall of the trough and at an angle upwardly in its extent from side to side of the base to position the body of an infant resting in the trough so that the entrance to the stomach of the infant through the esophagus is higher than the outlet from the stomach through the pylorus, the trough providing means for holding the body on the surface against sliding downwardly.

2. A device for preventing colic in infants as a result of the manner of feeding, which comprises a posture-defining support for the entire body of the infant, the support being constructed to fix the position of the body of the infant during feeding so that gases formed or trapped by the food entering the stomach will be provided a continuously maintained exit to the esophagus and not to the pylorus, the support comprising a base, and being shaped to provide a substantially horizontally disposed trough above the base and extending from side to side of the base, the trough providing means for receiving and retaining the buttocks of an infant, the trough including a wall extending upwardly from the trough into a surface to provide a rest for the dorsum of the infant, the surface extending from side to side of the base and being disposed at an angle to the horizontal in its extent from the wall of the trough and at an angle upwardly in its extent from side to side of the base to position the body of an infant resting in the trough so that the entrance to the stomach of the infant through the esophagus is higher than the outlet from the stomach through the pylorus, the trough providing means for holding the body on the surface against sliding downwardly.

3. A device for preventing colic in infants as a result of the manner of feeding, which comprises a posture-defining support for the entire body of the infant, the support being constructed to fix the position of the body of the infant during feeding so that gases formed or trapped by the food entering the stomach will be provided a continuously maintained exit to the esophagus and not to the pylorus, the support comprising a base, and being shaped to provide a substantially horizontally disposed trough above the base and extending from side to side of the base, the trough providing means for receiving and retaining the buttocks of an infant, the trough including a wall extending upwardly from the trough into a surface to provide a rest for the dorsum of the infant, the surface extending from side to side of the base and being disposed at an angle to the horizontal in its extent from the wall of the trough and at an angle upwardly in its extent from side to side of the base to raise the left side of the infant resting upon the surface and to turn the infant slightly to the right to position the body of an infant resting in the trough so that the entrance to the stomach of the infant through the esophagus is higher than the outlet from the stomach through the pylorus, the trough providing means for holding the body on the surface against sliding downwardly.

4. A device for preventing colic in infants as a result of the manner of feeding, which comprises a posture-defining support for the entire body of the infant, the support being constructed to fix the position of the body of the infant during feeding so that gases formed or trapped by the food entering the stomach will be provided a continuously maintained exit to the esophagus and not to the pylorus, the support comprising a base, and being shaped to provide a substantially horizontally disposed trough above the base and extending from side to side of the base, the trough providing means for receiving and retaining the buttocks of an infant, the trough including a wall extending upwardly from the trough into a surface to provide a rest for the dorsum of the infant, the surface extending from side to side of the base and being disposed at an angle of approximately 60° to the horizontal in its extent from the wall of the trough and at an angle upwardly in its extent from side to side of the base of approximately 10° from the normal plane of the surface in its extent upwardly from the wall to raise the left side of the infant resting upon the surface and to turn the infant slightly to the right to position the body of an infant resting in the trough so that the entrance to the stomach of the infant through the esophagus is higher than the outlet from the stomach through the pylorus, the trough providing means for holding the body on the surface against sliding downwardly.

WILLIAM SNOW.