

Description

This invention relates to the field of foam-forming equipment for fire extinguishing purposes, and more particularly to nozzles for the application of a foam formed from a liquid and foam-stabilizer mix.

Fire-fighting nozzles for the application of a water stream or a water fog have been known for some time. Such nozzles are attached to a fire hose and are adjusted to apply the fire-extinguishing liquid in a pattern ranging from a fog-like application to a straight stream. Liquid mixtures containing a foam-stabilizing concentrate have also been utilized in fire-fighting nozzles for the extinguishing of certain types or classes of fires. These foam-stabilizing concentrates will, when mixed with a liquid, aerated, and mechanically agitated, form a relatively stable foam that is particularly useful for the extinguishing of large fires.

The stabilizer is generally supplied as a concentrate that is inducted into the flowing liquid stream to form a mixture. Examples of such liquid foam-stabilizing concentrates are known under the trademarks, tight Water "AFFF," Light Water "AFFF/ATC" of Minnesota Mining and Manufacturing Company, Minnesota and "Emulsiflame" of Elkhart Brass Manufacturing Co., Inc. Other such stabilizers are generally described in U.S. Pat. Nos. 3,772,195; 3,562,156; 3,578,590; and 3,548,949.

The inventions described in U.S. Patent Nos. 4,497,442 and 4,640,461 disclose nozzles for applying a foam wherein a foam-stabilizing concentrate is inducted into a segment of a general flowing liquid stream, such as water, through the nozzle. In these inventions, the general inner bore of the nozzle communicates a liquid stream from a hose to the point of discharge. Eductor means within the inner bore extracts a foam-stabilizing concentrate from a supply and inducts it into a previously separated first segment of the liquid stream flowing through the general inner bore. At the discharge stem end of the nozzle the concentrate and liquid is agitated and aerated in a foam-forming chamber to form a stabilized foam and mixed with the remainder of the liquid stream. After combination with the remainder of the liquid stream, the foam is "thrown" in a desired pattern. An adjustable flow regulating means can regulate the rate of flow (gallons per minute) of the stream discharged.

The nozzle of U.S. Patent No. 4,497,442 improved the focus for the foam-liquid mixture discharged from the nozzle, reducing the dispersion of the foam stream from that discharged by previous nozzles. As a result, the nozzle of U.S. Patent No. 4,497,442 could apply or throw the foam over a greater distance than previous foam nozzles, with-

out the utilization of subsidiary pump means, thereby allowing the fire-fighter to operate a simplified nozzle and be freely removed from the fire.

GB-A-2 203 065 discloses a nozzle for use in fire fighting comprising a barrel defining an inlet for the supply of a pressurised fluid to the nozzle, a port for the supply of a foam concentrate to the nozzle, and an outlet for the egress of a foam solution from the nozzle. A primary venturi inductor is provided adjacent the port to enable the foam concentrate to be drawn into the barrel. A deflector is located adjacent the outlet to mix the pressurised fluid in the barrel with the concentrate in order to create a spray of foam solution egressing from the nozzle. The deflector is provided with a plurality of passageways defining a secondary venturi inductor and through which a proportion of the pressurised fluid can pass to create a venturi induction effect and thereby increase the suction power of the nozzle.

A general limitation, however, affecting the above inventions, and other nozzles, is that the nozzles are unable to produce, within the expansion range applicable to fire-fighting nozzles, a relatively highly aerated foam, with homogeneous bubbles, and also quickly adjust to supply a less-aerated foam with a higher, more optimal throw. Ideally, the fire-fighter should be able to quickly and easily adjust between an optimal foam and an optimal throw as conditions dictate. Highly aerated foam is advantageous in that it is more effective on polar solvent and alcohol fires. An optimal throw permits the fire-fighter to remain further removed from the fire and is suitable for hydrocarbon fires. The amount of agitation required to produce an optimal expansion varies with the concentrate formulation, water temperature, and water purity.

The present invention discloses a quickly adjustable foaming chamber stem for a foam-applying fire-fighting nozzle. On the one hand, an optimum, highly aerated, homogeneously bubbled foam can be applied from the nozzle. On the other hand, the fire-fighter can quickly switch to apply a less-aerated foam with an optimum throw. The present invention further provides a stem that can attach to a variety of foam-applying nozzles, either with or without an interior eductor system, for inducting the foam-stabilizing concentrate into the liquid flow in the nozzle.

The stem is comprised of a deflector plate and a mixing plate that define a foaming chamber there between. The deflector plate is attached to the nozzle near the discharge end of the nozzle's inner bore such that the plate restricts the flow of the liquid discharged from the inner bore of the nozzle. The major portion of the liquid flow is deflected around the periphery of the deflector plate. The deflector plate has however a plurality of ducts

that, when open, communicate a second portion of the liquid through the ducts and into the mixing chamber. Flow through the ducts in the deflector plate strike the mixing plate. The surface of the mixing plate is oriented such that portions of the liquid flowing through the ducts are reflected toward the center area of the mixing chamber. Means are provided to open and close at least some of the ducts. Means are provided to attach the stem to the nozzle.

The stem is designed to be compatible with a nozzle wherein the stabilizer is generally mixed with a segment of the liquid as the liquid flows through the bore of the nozzle. In this system, the stabilizer is inducted and mixed with a portion of the liquid in the bore of a central structural member. This stabilizer and liquid mixture is delivered to the mixing chamber through a central duct in the deflector plate.

Preferably, the ducts through the deflector plate, other than one central duct, are arranged around the periphery of the plate. Portions of the mixing plate struck by liquid flowing through the ducts of the deflector plate, other than the one central duct, are oriented to deflect the flow of liquid toward the central area of the mixing chamber and more particularly toward the junction of the deflector plate with the central area of the mixing chamber. The junction of the deflector plate with the central area of the mixing chamber will contain the opening of the one central duct. That duct may or may not communicate liquid flow, depending upon the style of nozzle to which the stem is attached.

FIG. 1 is a cross sectional view of the present invention attached to a nozzle with a straight bore and a stabilizer induction channel within the inner bore.

FIG. 2 is a cross sectional view of the present invention attached to a nozzle with an orificed bore and with no stabilizer induction channel within the inner bore.

FIG. 3 is a cross sectional view of the present invention attached to a nozzle with an orificed bore and with a stabilizer inductor channel within the inner bore.

FIG. 4 is a cross sectional view of the present invention attached to a nozzle having a central duct that conducts fluid and with the peripheral ducts open.

FIG. 5 is a cross sectional view of the present invention attached to a nozzle having a central duct that does not conduct fluid and with the peripheral ducts closed.

FIG. 6 is a break-away view exhibiting the construction of the stem.

In Drawings 1, 2, and 3, the letter N refers generally to a foam-applying nozzle of the type

used for fire-extinguishing purposes. The nozzle is adapted to apply a foam stream that exits the nozzle in the direction of arrows 80, the foam stream composed of a liquid W and a foam-stabilizing concentrate F. Briefly, the nozzle N includes an inner barrel I having an axial bore 10 with inlet 10i and outlet 10o for directing a liquid stream W from a hose, monitor, or other source (not shown). For reasons unrelated to this invention, the inlet 10i and outlet 10o may be of lesser diameter than bore 10, as illustrated by the nozzles in FIGS. 2 and 3. Such orificing of the inlet and outlet of the nozzle bore does not affect the dynamics of the nozzle and stem as disclosed. Inner barrel I contains structural elements 11 transverse bore 10 and structural element 12 essentially paralleling the length of bore 10. Further use of structural element 12 is described below.

Nozzle N may further involve a flow-regulating means coacting with the outlet 10o for regulating the lateral extent and the flow of the stream W (or W plus F) discharged from inner barrel I. The flow-regulating means generally includes the coactions of deflector plate D with the bore 15 of adjustable outer barrel B, being a tubular member telescopically mounted with inner barrel I, and with reflection edge 58 of the outlet 10o of inner barrel I. Deflector plate D is spaced apart, by distance 13, from the annular edge 58 to provide the opening through which a major portion of the fluid stream W (or W plus F) flows. The stem, comprised of deflector plate D and mixing plate M, is threadedly connected to structural portion 12 of inner barrel I. Provision is made for the placement of washers 12w in the threaded connection between the stem and the structural member such that distance 13 between deflector plate D and reflection edge 58 may be varied. The distance 13 between the edge of the deflector plate and the reflection edge essentially controls or regulates the amount of flow of the liquid stream W (or W plus F) through nozzle N.

Furthermore, as outer sleeve B is rotated or moved relative to inner barrel I, the overall length of nozzle N is increased or decreased. The positioning of outer sleeve B controllably selects the type of application, which ranges between positions creating a fog-like foam application to a position forming a straight-stream foam application. By varying distance 13, above, and the adjustable outer barrel B in relation to inner barrel I, the discharged fluid stream may be varied from a relatively compact small diameter stream to a wider, larger diameter spray.

Foam-stabilizing concentrate F may be supplied together with liquid W through inlet 10i of the inner barrel, as illustrated in FIG. 2. Alternately, as illustrated in FIGS. 1 and 3, eductor means E may

be provided within inner barrel I to extract foam-stabilizing concentrate F from an outside supply and supply the concentrate to the mixing chamber of the stem. The eductor means E forms a composition of F and liquid W by inducting a selected amount of the concentrate into a first portion W1 of the liquid stream W flowing through the inner barrel I, as follows. The eductor means E shown is generally comprised of a venturi type tube mounted within the structural member 12 within axial bore 10 of inner barrel I and is axially aligned with the flow of the liquid stream. As the liquid stream W flows into the inlet 10i, a first portion W1 of the stream W flows into tubular member 14, at inlet 14i, located within structural member 12. Tubular member 14 has a constricting portion 16 with an exit 16e. The first stream portion W1 exits from the member 14 at exit 16e and enters the axial bore 12b of structural member 12. While one branch of structural member 12 is adapted to receive member 14 and to contain axial bore 12b, the lower base segment 12c is adapted to receive the stabilizer concentrate to be mixed with the liquid. The interior cavity of bore 12b is larger dimensionally than the exit 16e of section 16 of member 14, thus causing the flow of stream W1 to expand in bore 12b. The expansion decreases the flow rate of the liquid stream portion W1. This slowing of the flow rate creates a reduced pressure in the bore 12b due to the venturi effect. The reduced pressure created by the venturi effect causes the substance F to flow from its supply so as to induct the substance F into the stream portion W1 in bore 12b. Structural member 12 is mounted having its axial bore 12b substantially aligned with the flow of the liquid stream W. Bore 12b has a discharge end with an outlet 12o, that feeds into mixing chamber C through a central duct 32c in deflector plate D of stem S.

Referring now more particularly to FIGS. 4 and 5, stem S is formed of a mixing plate M and a spaced-apart deflector plate D that forms a mixing chamber C there between for producing a foam from the liquid W and the foam-stabilizing concentrate F. Mixing plate M and deflector plate D are preferably mounted substantially perpendicular to the longitudinal axis of inner barrel I. FIG. 4 illustrates a stem attached to a nozzle with an eductor chamber in the center of the inner bore structural member for presenting the foam-stabilizing concentrate F to the mixing chamber, as in the nozzles of FIGS. 1 and 3. FIG. 5 illustrates the stem attached to a nozzle with no induction chamber in the central structural member 12, as in FIG. 2. Rather, the foam-stabilizing concentrate F and liquid W are both introduced into the inlet 10i of the nozzle. In fact, if the foam-stabilizing concentrate F and liquid W are both introduced into inlet

10i of the nozzle, even if the nozzle has an education chamber E, the chamber can be used to induct additional air through bore 12b into mixing chamber C. In this case, the air would be inducted into a first stream portion W1 that itself was already mixed with concentrate F.

Deflector plate D directs the main portion of the liquid stream W radially around the periphery of the deflector plate, through opening 13 between plate D and inner bore reflector edge 58, and around the periphery of mixing plate M. Deflector plate D, in addition, contains ducts 32 that, when open, permit passage of liquid stream W2 into the mixing chamber. Stream W2 may contain liquid or liquid and foam-stabilizing concentrate, depending upon the nozzle, design and utilization. Deflector D further contains duct 32c that may introduce a further fluid stream W1, containing concentrate F, into chamber C. The force of streams W1 and W2 entering the mixing chamber, and the effect of the main portion of the liquid stream deflecting around the periphery of the plates, draws the foam formed in the mixing chamber into the main stream of liquid at the periphery of the mixing chamber. From thence it is thrown out of the nozzle along the path of arrows 80.

Foam is formed in the mixing chamber by the agitation and turbulence of the streams of liquid containing foam-stabilizer F and by their impact upon the mixing plate and the deflector plate. Streams W1 and W2 impact mixing plate M. The surface of plate M impacted by stream W2 is oriented to reflect the stream into the center area A of the mixing chamber C, area A being indicated by dashed lines in FIGS. 4 and 5. More particularly, in the preferred embodiment, surface portions 36 of mixing plate M impacted by the stream W2 deflect that stream toward the junction of center area A and deflector plate D, as indicated by the arrows in FIGS. 4 and 5. That junction contains the opening of central duct 32c, which duct may or may not be connected to a nozzle communicating fluid therethrough, depending upon the type of nozzle being utilized. If duct 32c communicates fluid, that fluid, in the preferred embodiment, impacts mixing plate M at cone 34. The fluid, as illustrated in FIG. 4, is then deflected toward the periphery of the mixing chamber. To the extent that peripheral ducts 32 are open, the fluid flow from central duct 32c, reflected toward the periphery of the mixing chamber, will interact with and cause turbulence with the fluid from ducts 32 that are being reflected inward toward central area A of the mixing chamber. Two interactions of streams W2 with stream W1 take place. One takes place at the junction of duct 32c and the mixing chamber. The other takes place within the mixing chamber after stream W1 has been reflected outward by cone 34.

Mixing chamber C is maintained at approximately atmospheric pressure during the working of the nozzle. A mixing chamber at roughly atmospheric pressure is conducive to forming a foam comprised of small, thick-walled, homogeneous bubbles, which is the preferable foam for fire-fighting purposes.

When all ducts in deflector plate D are open, turbulence and agitation is maximized in the mixing chamber. A maximum foam is formed and pushed or drawn out into the main stream of liquid flowing around the periphery of the plates to be thereafter thrown from the nozzle. When some or all of the deflector ducts are closed, which is accomplished by turning handle H connected with plate P less foam is formed in the mixing chamber. The liquid stream with less foam discharged from the nozzle can be thrown from the nozzle at close to the nozzle's optimum throw distance.

In the preferred embodiment, handle H is attached to the outside, or discharge side, of mixing plate M. As exhibited in FIG. 6, handle H is attached by screws 64, spacers 68, and screws 76 to ring-shaped plate P that abuts the nozzle side of deflector plate D. Connecting pieces 68 extend through slots 72 and 74 in plates M and D, respectively. Plate P contains ducts 32p that align with at least some of the ducts 32 of deflector plate D when plate P is in a first position. When plate P is moved to a second position, at least some of the ducts 32p in P and ducts 32 in D are not aligned and so at least some streams W2 are unable to communicate through the deflector plate. Spring 66 compressed between mixing plate M and handle H serves to bias plate P against deflector plate D to maintain the plate P in its first or second position.

FIG. 6 illustrates the construction of stem S in a preferred embodiment. Screws 62 extending through plate M and spacers 70 attach and space plate M from plate D. Spacers 70 can be varied to change the separation distance of M from D. Handle H is connected to plate P by means of connector pieces 68 that extend through opening 72 and 74 in plates M and D respectively. Screws 76 and 64 extending through plate P and M respectively, threadedly attach to connector pieces 68. Threaded element 12t illustrates the means for threadedly connecting the stem with central structural member 12 of the nozzle. Within threaded element 12t is the deflector plate's central duct 32c, which may or may not communicate with a bore in structural member 12. In FIG. 6, plate P is shown with ducts 32p that align with ducts 32 in deflector plate D when plate P is in a first position. Spacer washer 12w is shown for use in regulating the threaded connection of stem S with nozzle N in order to regulate distance 13 through which the main portion of the liquid stream discharges between the

periphery of deflector plate D and reflector edge 58 of inner bore I.

FIG. 5 shows handle H and plate P oriented such that ducts 32 are open. FIG. 4 shows handle H and plate P oriented such that ducts 32 are not open. Handle H is easily graspable and turned by the fire-fighter during operation.

Claims

1. An adjustable foaming chamber stem for attachment to a foam-applying nozzle (N) having a bore (10) through which pass liquid (W) and a stabilizer (F), a deflector plate (D) adapted to be affixed to the nozzle end approximate the discharge end of the bore such that the plate restricts the flow of liquid discharged, the plate having a plurality of ducts (32) that communicate through the plate in the direction of flow, a mixing plate (M) affixed to and separated from the deflector plate (D) such that some liquid flowing through the ducts strikes the mixing plate, the two plates forming a foaming chamber (C) between them wherein the orientation of portions of the surface of the mixing plate (M) is coordinated with the direction of flow of liquid from some of the ducts (32) such that some liquid striking the mixing plate (M) is reflected toward the center area of the mixing chamber (C), means for attaching the stem (S) to the foam-applying nozzle, and characterized in that at least some of the ducts are adjustable between an opened and a closed position and the stem (S) further comprises means (H,P) for opening and closing at least some of the ducts.
2. The invention of claim 1, wherein the stabilizer (F) is generally mixed with the liquid (W) flowing through the bore of the nozzle.
3. The invention of claim 2, wherein the ducts (32) are located around the periphery of the deflector plate (D).
4. The invention of claim 1, wherein one duct (32c) is located in the center of the deflector plate and the stabilizer is conveyed through the bore of the nozzle such that the stabilizer is conducted through the deflector plate through only the central duct.
5. The invention of claim 4, wherein the ducts (32) other than the central duct are located around the periphery of the deflector plate.
6. The invention of claim 3 or 5, wherein the liquid reflected toward the center area of the



Mixing chamber C is maintained at approximately atmospheric pressure during the working of the nozzle. A mixing chamber at roughly atmospheric pressure is conducive to forming a foam comprised of small, thick-walled, homogeneous bubbles, which is the preferable foam for fire-fighting purposes.

When all ducts in deflector plate D are open, turbulence and agitation is maximized in the mixing chamber. A maximum foam is formed and pushed or drawn out into the main stream of liquid flowing around the periphery of the plates to be thereafter thrown from the nozzle. When some or all of the deflector ducts are closed, which is accomplished by turning handle H connected with plate P less foam is formed in the mixing chamber. The liquid stream with less foam discharged from the nozzle can be thrown from the nozzle at close to the nozzle's optimum throw distance.

In the preferred embodiment, handle H is attached to the outside, or discharge side, of mixing plate M. As exhibited in FIG. 6, handle H is attached by screws 64, spacers 68, and screws 76 to ring-shaped plate P that abuts the nozzle side of deflector plate D. Connecting pieces 68 extend through slots 72 and 74 in plates M and D, respectively. Plate P contains ducts 32p that align with at least some of the ducts 32 of deflector plate D when plate P is in a first position. When plate P is moved to a second position, at least some of the ducts 32p in P and ducts 32 in D are not aligned and so at least some streams W2 are unable to communicate through the deflector plate. Spring 66 compressed between mixing plate M and handle H serves to bias plate P against deflector plate D to maintain the plate P in its first or second position.

FIG. 6 illustrates the construction of stem S in a preferred embodiment. Screws 62 extending through plate M and spacers 70 attach and space plate M from plate D. Spacers 70 can be varied to change the separation distance of M from D. Handle H is connected to plate P by means of connector pieces 68 that extend through opening 72 and 74 in plates M and D respectively. Screws 76 and 64 extending through plate P and M respectively, threadedly attach to connector pieces 68. Threaded element 12t illustrates the means for threadedly connecting the stem with central structural member 12 of the nozzle. Within threaded element 12t is the deflector plate's central duct 32c, which may or may not communicate with a bore in structural member 12. In FIG. 6, plate P is shown with ducts 32p that align with ducts 32 in deflector plate D when plate P is in a first position. Spacer washer 12w is shown for use in regulating the threaded connection of stem S with nozzle N in order to regulate distance 13 through which the main portion of the liquid stream discharges between the

periphery of deflector plate D and reflector edge 58 of inner bore I.

FIG. 5 shows handle H and plate P oriented such that ducts 32 are open. FIG. 4 shows handle H and plate P oriented such that ducts 32 are not open. Handle H is easily graspable and turned by the fire-fighter during operation.

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2. The invention of claim 1, wherein the stabilizer (F) is generally mixed with the liquid (W) flowing through the bore of the nozzle.
3. The invention of claim 2, wherein the ducts (32) are located around the periphery of the deflector plate (D).
4. The invention of claim 1, wherein one duct (32c) is located in the center of the deflector plate and the stabilizer is conveyed through the bore of the nozzle such that the stabilizer is conducted through the deflector plate through only the central duct.
5. The invention of claim 4, wherein the ducts (32) other than the central duct are located around the periphery of the deflector plate.
6. The invention of claim 3 or 5, wherein the liquid reflected toward the center area of the



mixing chamber (C) is reflected more particularly toward the junction of the center area of with the deflector plate (D).

7. The invention of claim 1, wherein the deflector plate (D) is affixed to the nozzle (N) such that the location of the deflector plate can be varied to vary the restriction that the plate offers to the flow of liquid around the periphery.
8. The invention of claim 1, wherein the distance that the mixing plate is separated from the deflector plate can be varied.
9. The invention of claim 6, wherein the ducts (32) are oriented so that flow through the ducts is approximately parallel to flow through the nozzle bore (10) and wherein some portions of the surface of the mixing plate (M) are inclined inward to reflect the liquid from the ducts striking those portions toward the junction of the center area with the deflector plate (D).
10. The invention of claim 9, wherein the deflector plate (D) and mixing plate (M) are approximately circular and of substantially the same size and wherein the inside rim portion (36) of the mixing plate, that faces the peripherally located ducts of the deflector plate is inclined inward.
11. The invention of claim 4, wherein a portion of the surface of the mixing plate (M) struck by the liquid and stabilizer communicated through the central duct assumes a conical shape with the apex facing the central duct.
12. The invention of claim 10, wherein the means for opening and closing some of the ducts is comprised of a third plate (P) that abuts, is concentric with, and rotates with respect to, the deflector plate (D) so that when the third plate (P) is rotated to a first position, at least some of the ducts (32) in the deflector plate (D) are open and when the third plate (P) is rotated to a second position, at least some of the ducts (32) in the deflector plate (D) are closed.
13. The invention of claim 12, wherein the third plate (P) is rotated by means of a handle (H) located forward of the mixing plate (M), which handle is affixed to the third plate (P) by means that extend through the mixing plate (M) and the deflector plate (D).

Patentansprüche

1. Einstellbares Schäumkammerglied für die Anbringung an einer Schaumapplikationsdüse (N), mit einer Bohrung (10), durch welche Flüssigkeit (W) und ein Stabilisator (F) strömen, einer Leitplatte (D), die zur Befestigung an dem Düsenende nahe dem Ausgabeende der Bohrung ausgebildet ist, derart, daß die Platte den Strom der ausgegebenen Flüssigkeit begrenzt, wobei die Platte eine Mehrzahl von Kanälen (32) aufweist, die durch die Platte in Strömungsrichtung kommunizieren, einer Mischplatte (M), die an und getrennt von der Leitplatte (D) befestigt ist, derart, daß ein Teil der durch die Kanäle strömenden Flüssigkeit auf die Mischplatte auftrifft, wobei die beiden Platten eine Mischkammer (C) zwischen sich bilden, in der die Ausrichtung von Teilbereichen der Oberfläche der Mischplatte (M) abgestimmt ist auf die Strömungsrichtung der Flüssigkeit aus einigen der Kanäle (32) derart, daß ein Teil der auf die Mischplatte (M) auftreffenden Flüssigkeit gegen den mittleren Bereich der Mischkammer (C) reflektiert wird, und Mitteln für die Anbringung des Gliedes (S) an der Schaumapplikationsdüse, **dadurch gekennzeichnet**, daß mindestens einige der Kanäle zwischen einer offenen und einer geschlossenen Stellung einstellbar sind, und das Glied (S) weiterhin Mittel (H, P) für das Öffnen und das Schließen mindestens einiger der Kanäle einschließt.
2. Die Erfindung gemäß Anspruch 1, worin der Stabilisator (F) im wesentlichen mit der durch die Bohrung der Düse strömenden Flüssigkeit (W) gemischt wird.
3. Die Erfindung gemäß Anspruch 2, worin die Kanäle (32) um den Umfang der Leitplatte (D) herum angeordnet sind.
4. Die Erfindung gemäß Anspruch 1, worin ein Kanal (32c) in der Mitte der Leitplatte angeordnet ist, und der Stabilisator so durch die Bohrung der Düse geleitet wird, daß der Stabilisator durch die Leitplatte durch nur den mittleren Kanal geführt wird.
5. Die Erfindung gemäß Anspruch 1, worin die Kanäle (32) anders als der mittlere Kanal um den Umfang der Leitplatte herum angeordnet sind.
6. Die Erfindung gemäß Anspruch 3 oder 5, worin die gegen den mittleren Bereich der Mischkammer (C) hin reflektierte Flüssigkeit insbe-



sondere gegen die Verbindung des mittleren Bereichs mit der Leitplatte (D) hin reflektiert wird.

7. Die Erfindung gemäß Anspruch 1, worin die Leitplatte (D) so an der Düse (N) befestigt ist, daß die Lage der Leitplatte veränderbar ist, um die Begrenzung, welche die Leitplatte dem Flüssigkeitsstrom um den Umfang herum bietet, zu verändern.
8. Die Erfindung gemäß Anspruch 1, worin der Abstand, um welchen die Mischplatte von der Leitplatte getrennt ist, veränderbar ist.
9. Die Erfindung gemäß Anspruch 6, worin die Kanäle (32) so ausgerichtet sind, daß die Strömung durch die Kanäle annähernd parallel zur Strömung durch die Düsenbohrung (10) erfolgt, und worin einige Teilbereiche der Oberfläche der Mischplatte (M) einwärts geneigt sind, um die aus den Kanälen auf diese Teilbereiche auftreffende Flüssigkeit gegen die Verbindung des mittleren Bereichs mit der Leitplatte (D) hin zu reflektieren.
10. Die Erfindung gemäß Anspruch 9, worin die Leitplatte (D) und die Mischplatte (M) annähernd kreisförmig und von im wesentlichen gleicher Größe sind, und worin der innenseitige Randbereich (36) der Mischplatte, der den umfänglich angeordneten Kanälen der Leitplatte gegenüberliegt, einwärts geneigt ist.
11. Die Erfindung gemäß Anspruch 4, worin ein Teilbereich der Oberfläche der Mischplatte (M), auf den die Flüssigkeit und der Stabilisator, die durch den mittleren Kanal geführt werden, aufprallen, eine konische Form einnimmt, mit dem mittleren Kanal gegenüberliegender Spitze.
12. Die Erfindung gemäß Anspruch 10, worin die Mittel für das Öffnen und das Schließen einiger der Kanäle eine dritte Platte (P) einschließen, die der Leitplatte (D) anliegt, damit konzentrisch ist und sich ihr gegenüber dreht, so daß, wenn die dritte Platte (P) in eine erste Stellung gedreht ist, mindestens einige der Kanäle (32) in der Leitplatte (D) offen sind, und, wenn die dritte Platte (P) in eine zweite Stellung gedreht ist, mindestens einige der Kanäle (32) in der Leitplatte (D) geschlossen sind.
13. Die Erfindung gemäß Anspruch 12, worin die dritte Platte (P) mittels eines Griffes (H) gedreht wird, der vorn vor der Mischplatte (M) angeordnet ist, welcher Griff an der dritten

Platte (P) durch Mittel befestigt ist, die sich durch die Mischplatte (M) und die Leitplatte (D) erstrecken.

5 Revendications

1. Embase de chambre à mousse réglable destinée à une fixation d'une buse pour appliquer de la mousse (N) comportant un trou (10) à travers lequel passent un liquide (W) et un stabilisateur (F), une plaque déflectrice (D) étant adaptée pour être fixée à l'extrémité de la buse proche de l'extrémité d'évacuation du trou de telle sorte que la plaque limite l'écoulement du liquide évacué, la plaque portant une pluralité de conduits (32) qui communiquent à travers la plaque dans la direction de l'écoulement, une plaque de mélange (M) fixée à et séparée de la plaque déflectrice (B) de telle sorte que le liquide circulant à travers les conduits heurtent la plaque de mélange, les deux plaques formant une chambre à mousse (C) entre elles dans laquelle l'orientation des parties de la surface de la plaque de mélange (M) est coordonnée avec la direction de l'écoulement du liquide venant de certains des conduits (32) de telle sorte que ce liquide heurtant la plaque de mélange (M) est réfléchi vers la zone centrale de la chambre de mélange (C), un moyen pour fixer l'embase (S) à la buse pour appliquer de la mousse, et caractérisé en ce qu'au moins certains des conduits sont réglables entre une position ouverte et une position fermée et en ce que l'embase (S) comprend, de plus, un moyen (H,P) pour ouvrir et fermer au moins certains des conduits.
2. Invention selon la revendication 1, dans laquelle le stabilisateur (F) est généralement mélangé au liquide (W) circulant à travers le trou de la buse.
3. Invention selon la revendication 2 dans laquelle les conduits (32) sont situés autour de la périphérie de la plaque déflectrice (D).
4. Invention selon la revendication 1, dans laquelle un conduit (32c) est situé au centre de la plaque déflectrice et le stabilisateur est transféré à travers le trou de la buse de telle sorte que le stabilisateur est conduit à travers la plaque déflectrice uniquement par l'intermédiaire du conduit central.
5. Invention selon la revendication 4, dans laquelle les conduits (32) autres que le conduit central sont situés autour de la périphérie de la



plaque déflectrice.

6. Invention selon la revendication 3 ou 5, dans laquelle le liquide réfléchi vers la zone centrale de la chambre de mélange (C) est réfléchi plus particulièrement vers la jonction avec la zone centrale de la plaque déflectrice (D).

7. Invention selon la revendication 1, dans laquelle la plaque déflectrice (D) est fixée à la buse (N) de telle sorte que la position de la plaque déflectrice peut être modifiée pour faire varier la limitation que la plaque présente à l'écoulement du liquide autour de la périphérie.

8. Invention selon la revendication 1, dans laquelle on peut modifier la distance selon laquelle la plaque de mélange est séparée de la plaque déflectrice.

9. Invention selon la revendication 6, dans laquelle les conduits (32) sont orientés de sorte que l'écoulement à travers les conduits est approximativement parallèle à la circulation à travers le trou de la buse (10) et dans laquelle certaines parties de la surface de la plaque de mélange (M) sont inclinées vers l'intérieur pour réfléchir le liquide, venant des conduits heurtant ces parties, vers la jonction de la zone centrale avec la plaque déflectrice (D).

10. Invention selon la revendication 9, dans laquelle la plaque déflectrice (D) et la plaque de mélange (M) sont approximativement circulaires et sensiblement de la même dimension et dans laquelle la partie de bordure intérieure (36) de la plaque de mélange, qui fait face aux conduits situés à la périphérie de la plaque déflectrice est inclinée vers l'intérieur.

11. Invention selon la revendication 4, dans laquelle une partie de la surface de la plaque de mélange (M) heurtée par le liquide et le stabilisateur transmis à travers le conduit central présente une forme conique, le sommet faisant face au conduit central.

12. Invention selon la revendication 10, dans laquelle le moyen pour ouvrir et fermer certains des conduits est constitué d'une troisième plaque (P) qui vient en butée de, est concentrique à, et tourne par rapport à la plaque déflectrice (D) de sorte que, lorsque la troisième plaque (P) est tournée vers une première position, au moins certains des conduits (32) de la plaque déflectrice (D) sont ouverts et lorsque la troisième plaque (P) est tournée vers une seconde position, au moins certains des conduits

(32) de la plaque déflectrice (D) sont fermés.

13. Invention selon la revendication 12, dans laquelle la troisième plaque (P) est tournée à l'aide d'une manette (H) située à l'avant de la plaque de mélange (M) laquelle manette est fixée à la troisième place (P) à l'aide d'un moyen qui s'étend à travers la plaque de mélange (M) et la plaque déflectrice (D).