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Langlais et al.

(54) COMMINGLING FLOW BETWEEN TRANSPORT TUBES OF A MULTI-TRANSPORT TUBE SHUNT SYSTEM

(71) Applicant: **Schlumberger Technology Corporation**, Sugar Land, TX (US)

(72) Inventors: **Michael Dean Langlais**, Houston, TX (US); **Amrendra Kumar**, Houston, TX (US)

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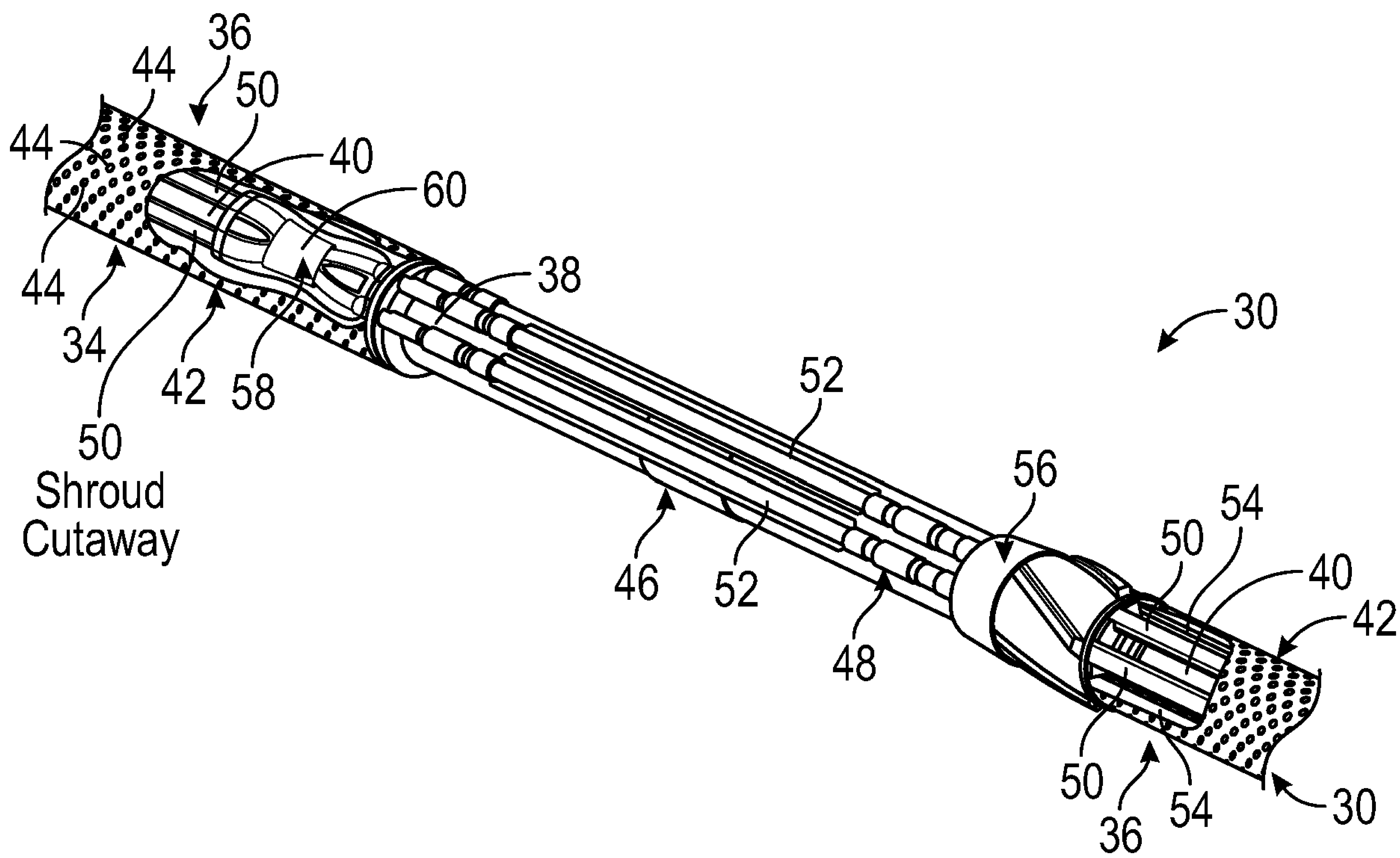
(52) **U.S. Cl.**

CPC ***E21B 43/04*** (2013.01); ***E21B 43/08*** (2013.01); ***E21B 17/02*** (2013.01)

(57) **ABSTRACT**

A technique facilitates gravel packing along a borehole. According to an embodiment, a shunt system is positioned along a sand screen system. The shunt system comprises a plurality of transport tubes and a plurality of packing tubes. A manifold is coupled to the plurality of transport tubes and to the plurality of packing tubes at a corresponding sand screen joint of the sand screen system. The manifold serves to separate a portion of the gravel slurry flowing through the plurality of transport tubes and to direct the portion into the corresponding packing tubes. Additionally, a commingler is positioned along the plurality of transport tubes at a location separate from the manifold. The commingler has an internal chamber where gravel slurry is received from uphole transport tube sections and is commingled before flowing into downhole transport tube sections.



Showing connection region of two joints of 2x2 shunted screens

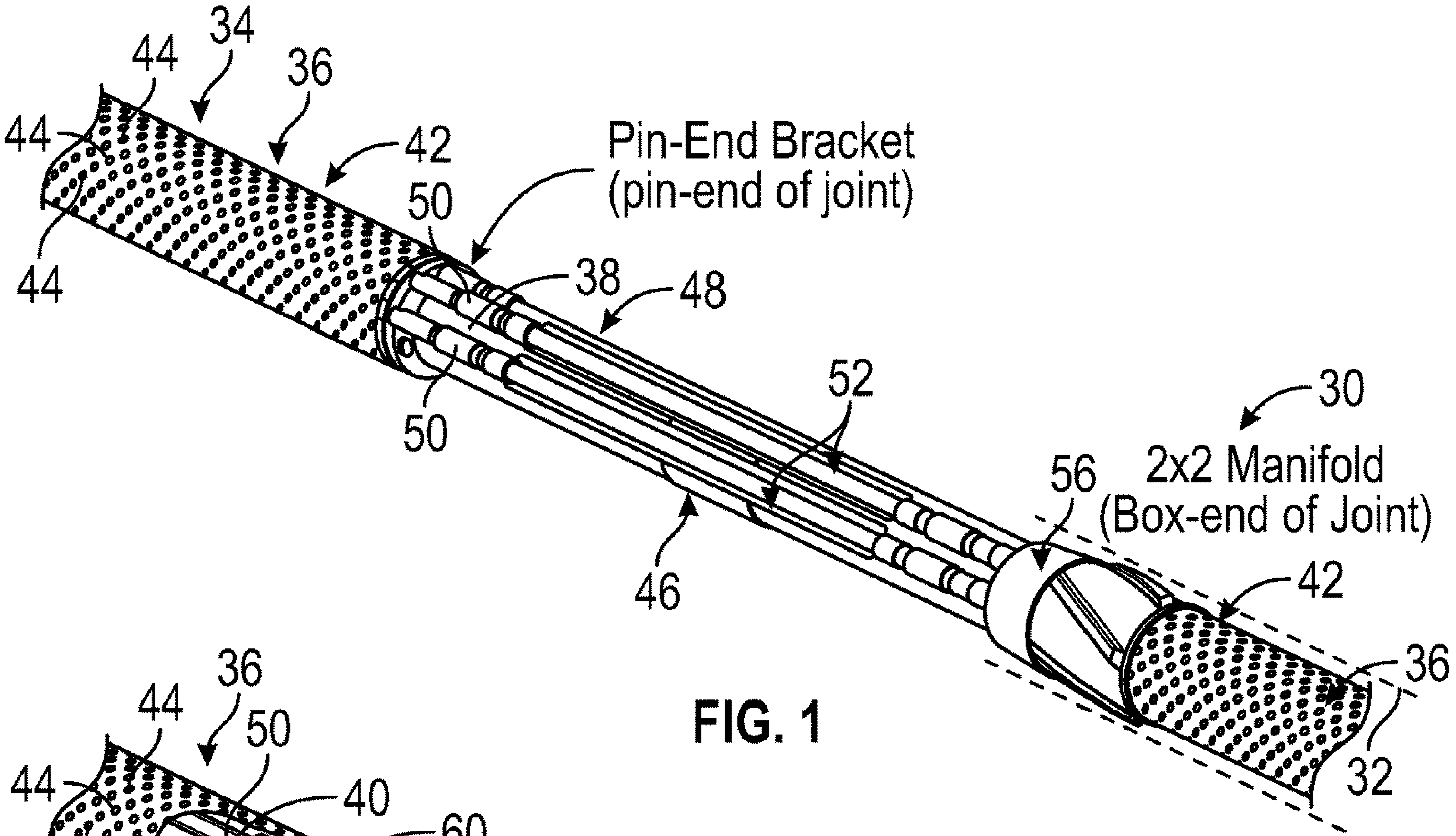


FIG. 1

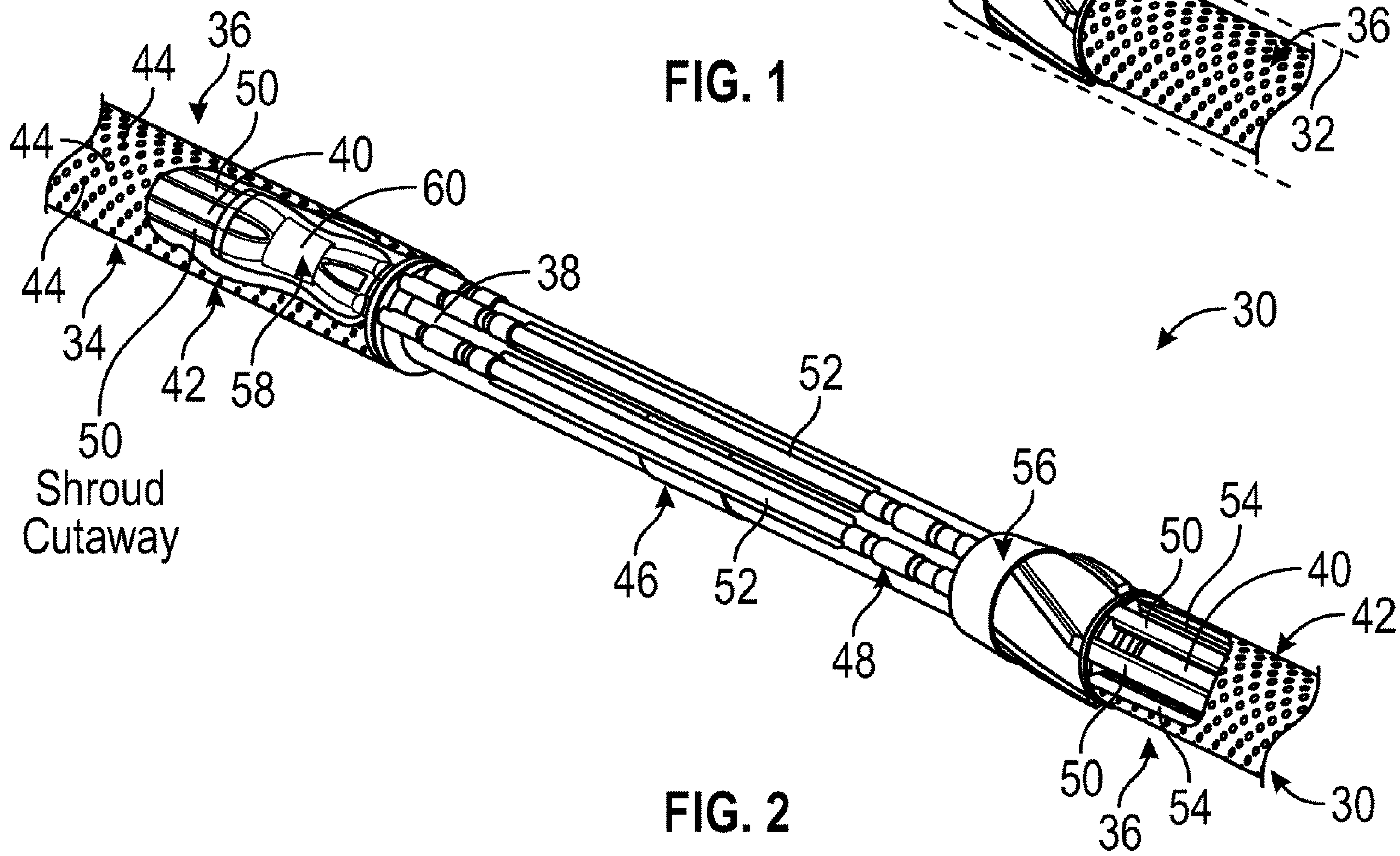


FIG. 2

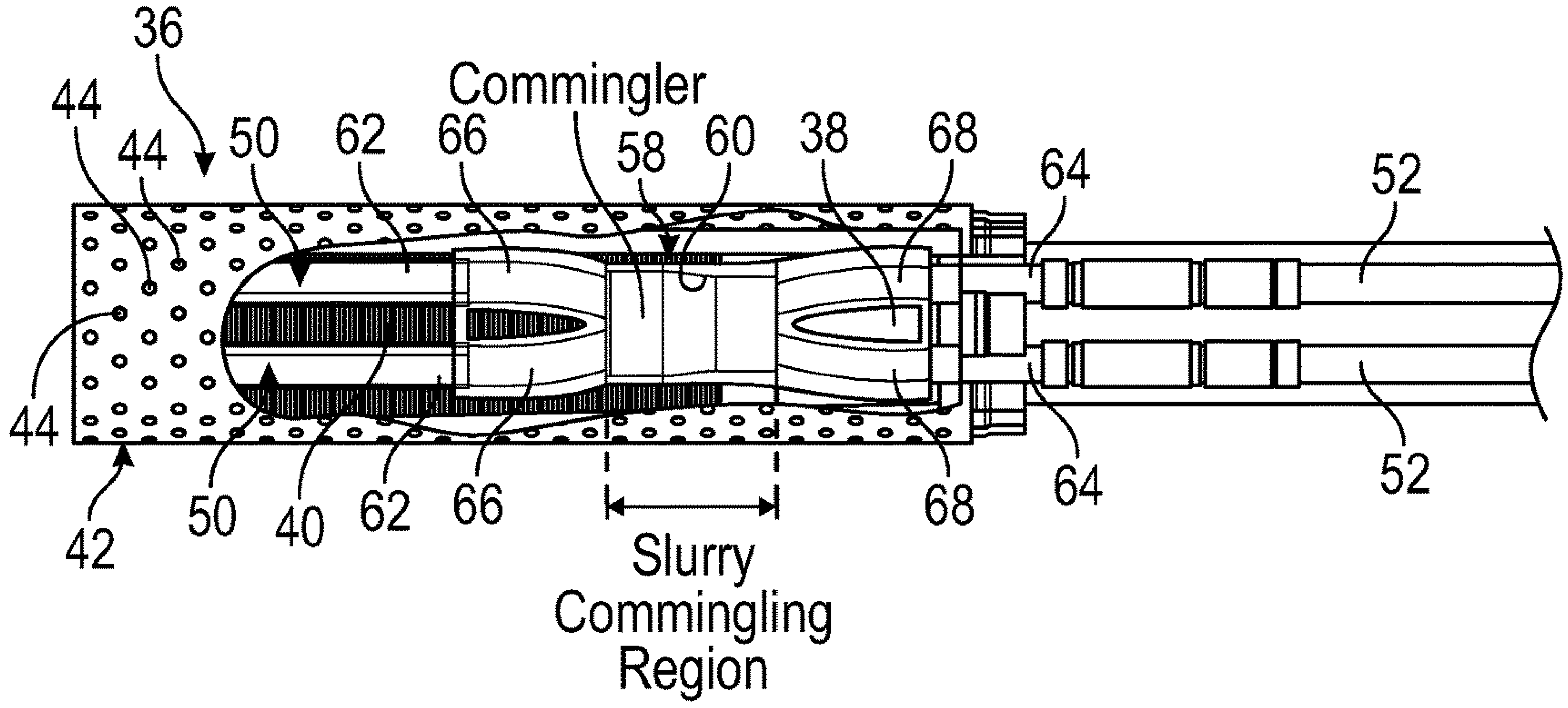


FIG. 3

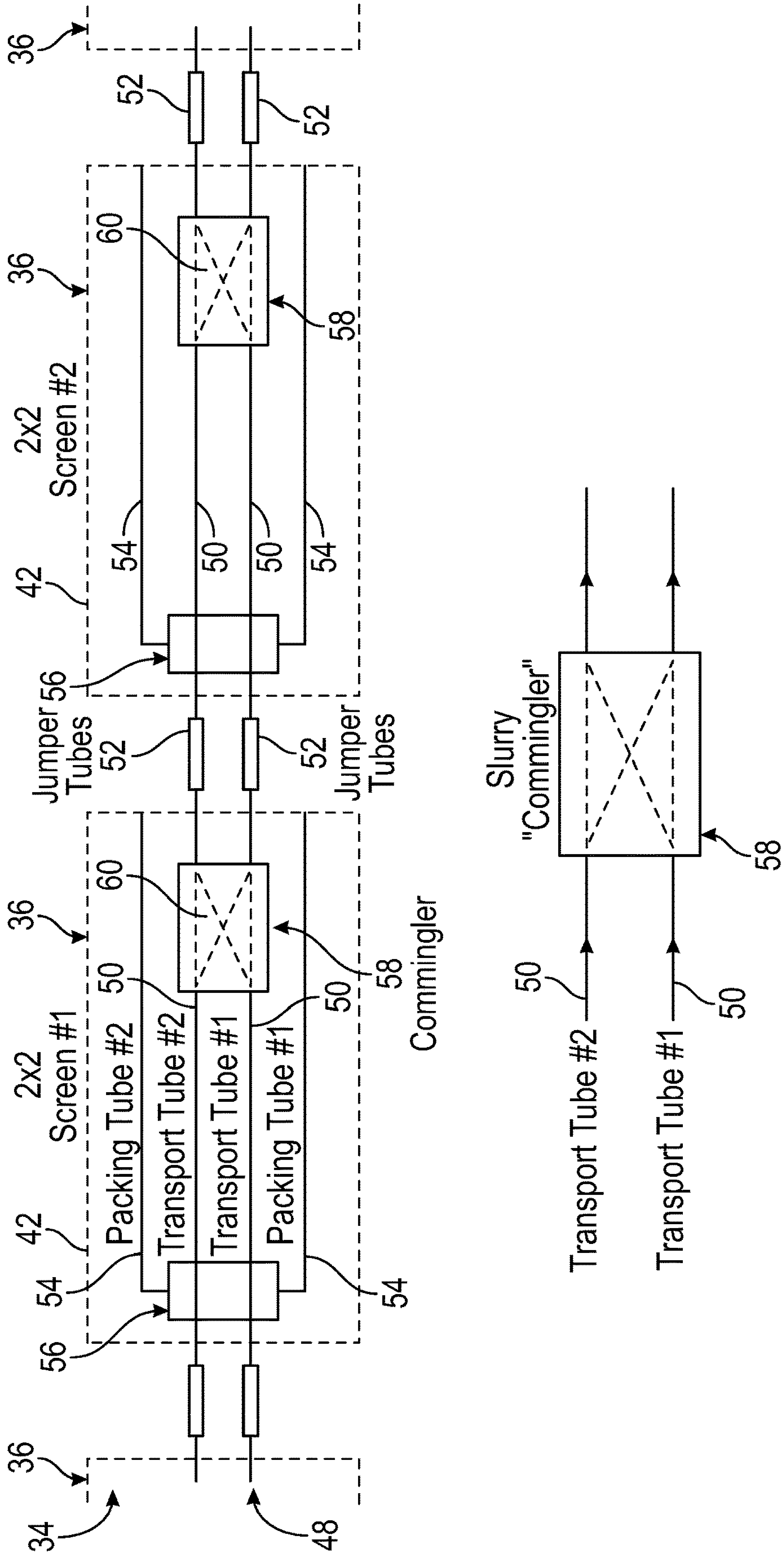

36
36
36
36
52
52
52
52
60
60
58
58
58
2x2
Screen #2
2x2
Screen #1
42
42
54
54
54
54
50
50
50
50
50
50
56
56
Jumper
Tubes
Jumper
Tubes
Packing Tube #2
Transport Tube #2
Transport Tube #1
Packing Tube #1
Commingler
34
48
Slurry
"Commingler"
Transport Tube #2
Transport Tube #1

FIG. 4

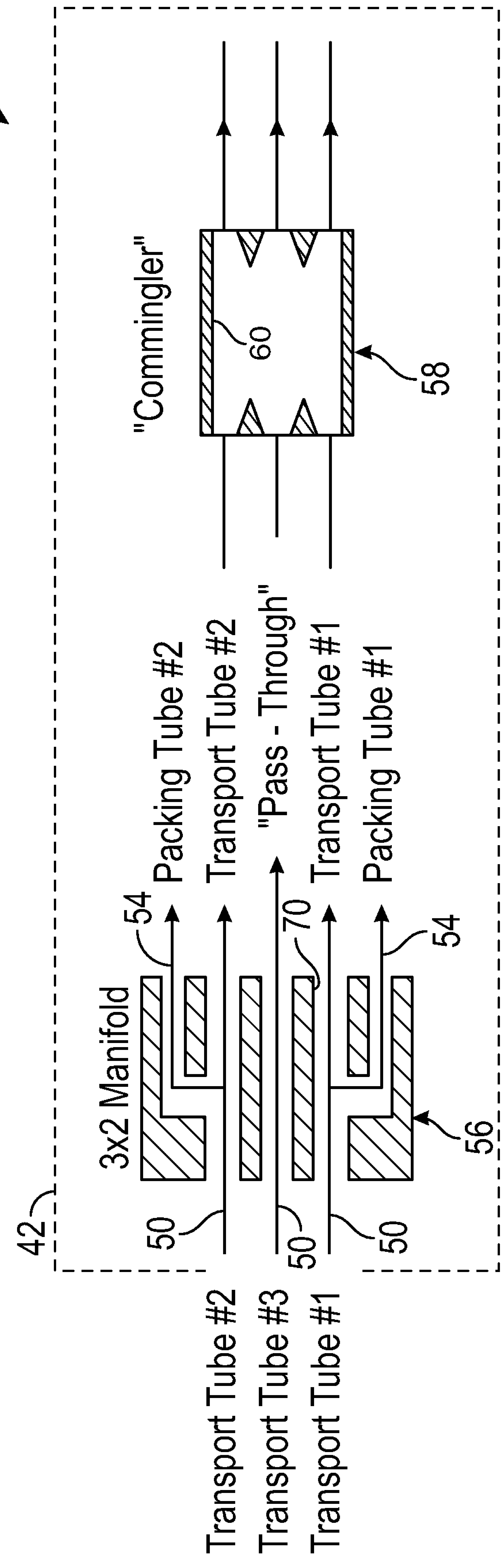

36
42
3x2 Manifold
"Commingler"
60
58
56
54
54
70
50
50
50
Transport Tube #2
Transport Tube #3
Transport Tube #1
Packing Tube #2
Transport Tube #2
"Pass - Through"
Transport Tube #1
Packing Tube #1

FIG. 5

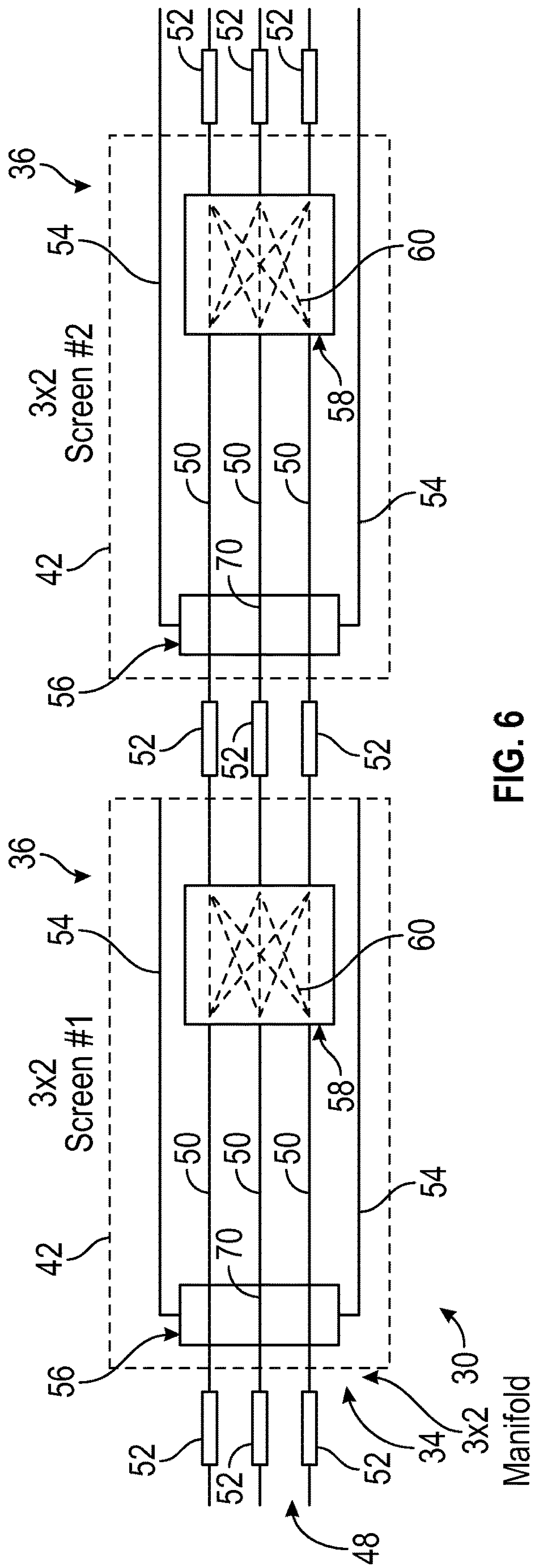

3x2
Screen #2
3x2
Screen #1
3x2
Manifold
30
34
36
42
48
50
52
54
56
58
60
70

FIG. 6

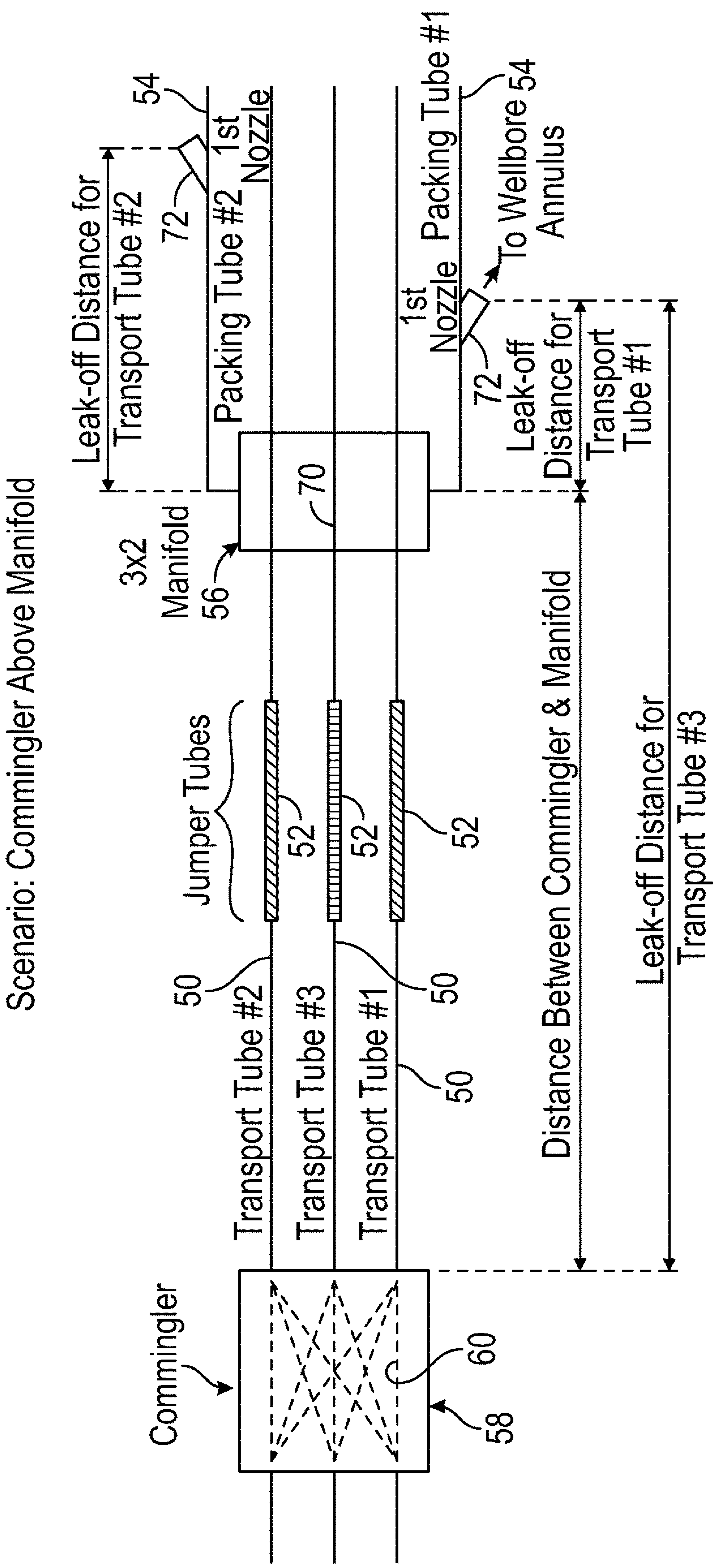

Scenario: Commingler Above Manifold
Commingler
58
60
Transport Tube #2
Transport Tube #3
Transport Tube #1
50
50
50
Jumper Tubes
52
52
52
3x2 Manifold
56
70
Packing Tube #2
Packing Tube #1
54
54
1st Nozzle
1st Nozzle
72
72
To Wellbore Annulus
Leak-off Distance for Transport Tube #2
Leak-off Distance for Transport Tube #1
Distance Between Commingler & Manifold
Leak-off Distance for Transport Tube #3

FIG. 7

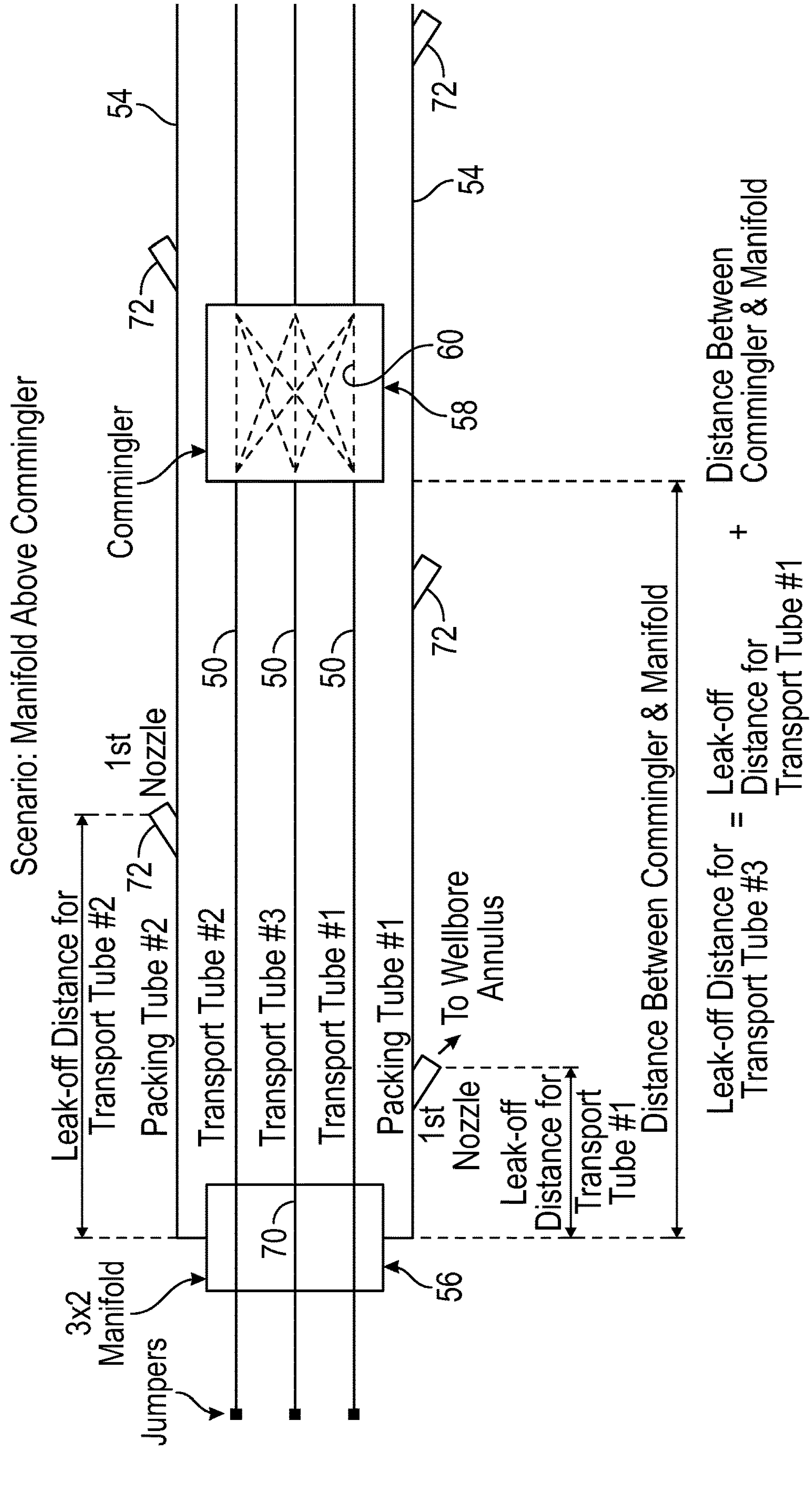

Scenario: Manifold Above Commingler
Leak-off Distance for Transport Tube #2
1st Nozzle
Commingler
3x2 Manifold
Jumpers
Packing Tube #2
Transport Tube #2
Transport Tube #3
Transport Tube #1
Packing Tube #1
To Wellbore Annulus
1st Nozzle
Leak-off Distance for Transport Tube #1
Distance Between Commingler & Manifold
Leak-off Distance for Transport Tube #3 = Leak-off Distance for Transport Tube #1 + Distance Between Commingler & Manifold
54
72
72
54
72
60
58
50
50
50
72
70
56

FIG. 8

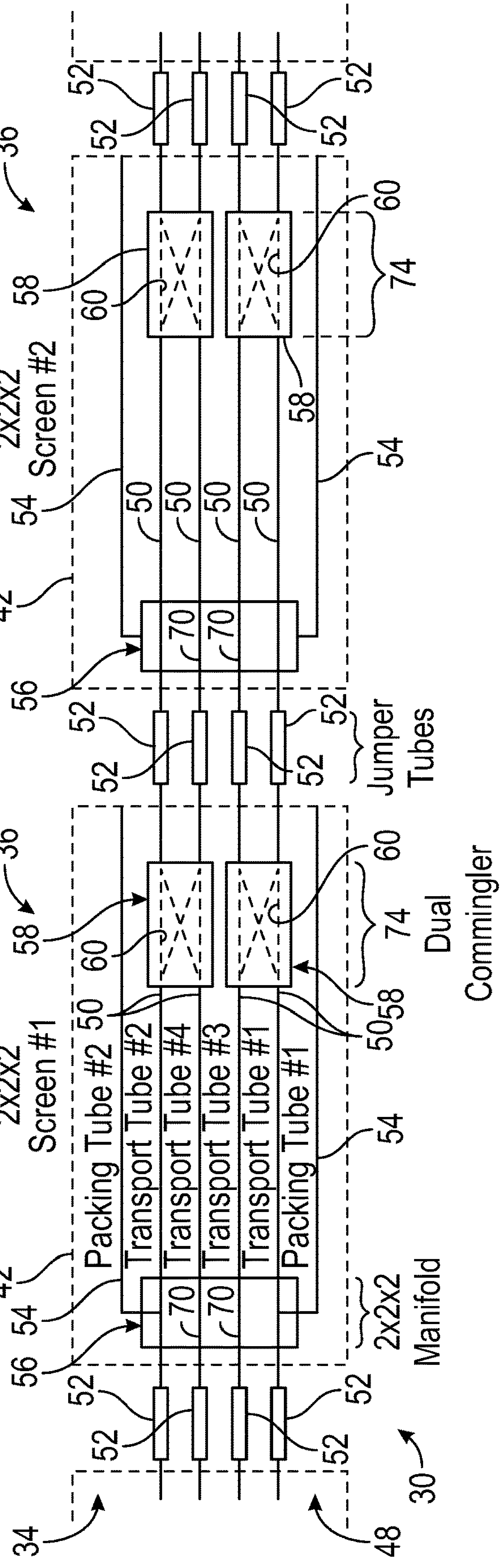

36
2x2x2
Screen #2
Jumper
Tubes
2x2x2
Screen #1
Packing Tube #2
Transport Tube #2
Transport Tube #4
Transport Tube #3
Transport Tube #1
Packing Tube #1
Dual
Commingler
2x2x2
Manifold
30
34
42
48
50
52
54
56
58
60
70
74

FIG. 9

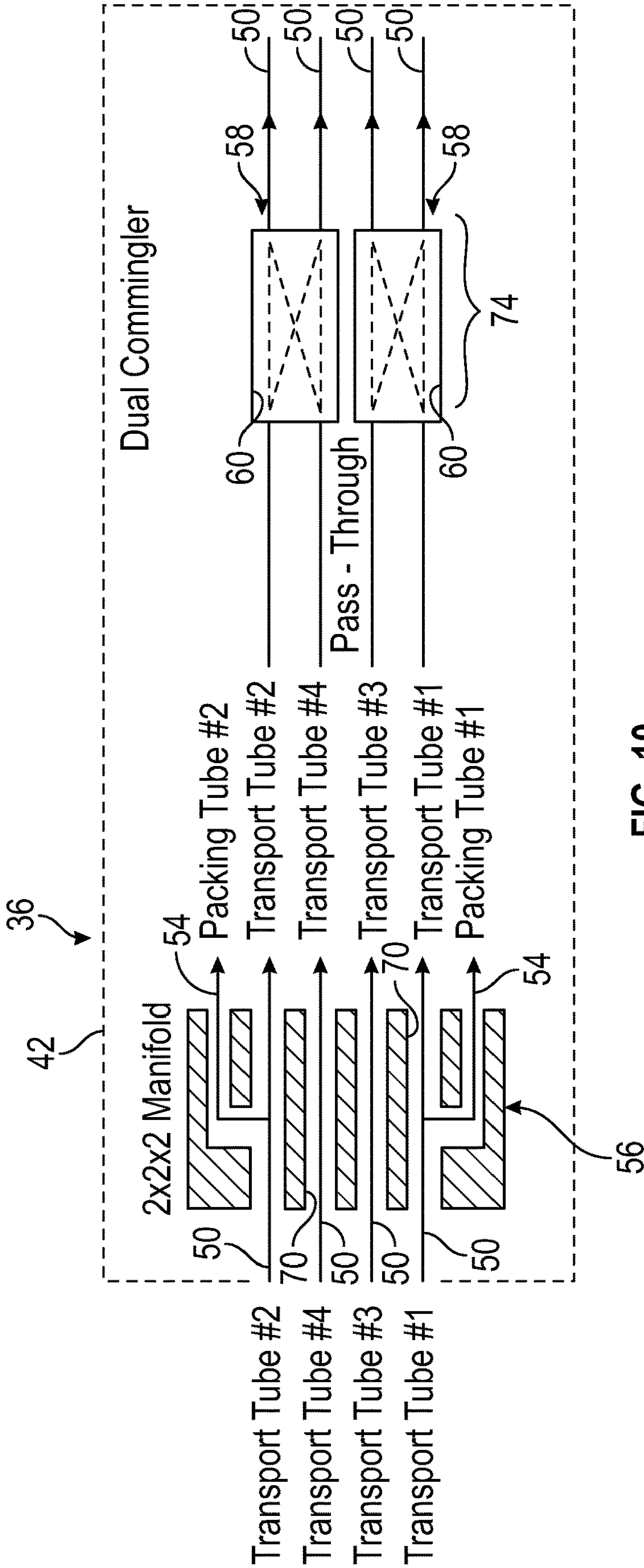

Dual Commingler
2x2x2 Manifold
Pass - Through
Packing Tube #2
Transport Tube #2
Transport Tube #4
Transport Tube #3
Transport Tube #1
Packing Tube #1
Transport Tube #2
Transport Tube #4
Transport Tube #3
Transport Tube #1
36
42
50
54
56
58
60
70
74

FIG. 10

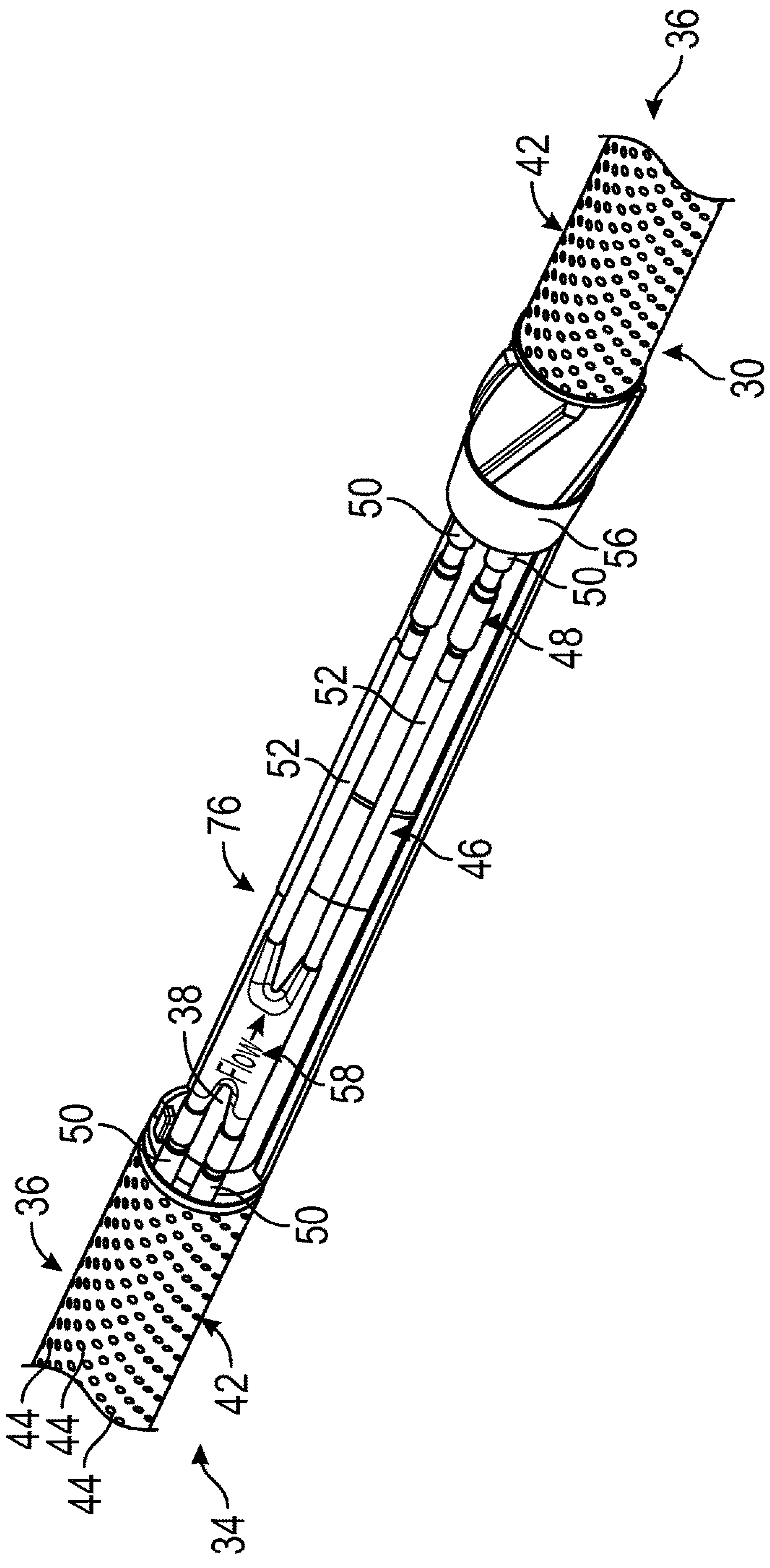


FIG. 11A

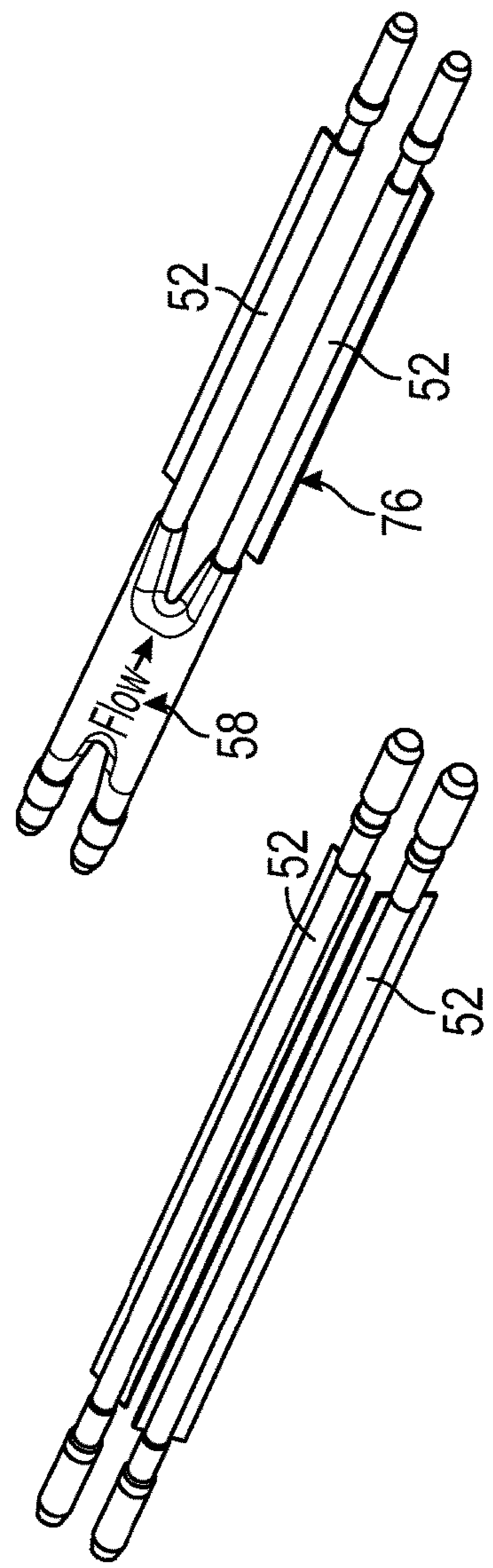


FIG. 11B

COMMINGLING FLOW BETWEEN TRANSPORT TUBES OF A MULTI-TRANSPORT TUBE SHUNT SYSTEM

CROSS-REFERENCE TO RELATED APPLICATION

[0001] The present document is based on and claims priority to U.S. Provisional Patent Application Ser. No. 62/826,235, filed Mar. 29, 2019, which is incorporated herein by reference in its entirety.

BACKGROUND

[0002] Gravel packs are used in wells for removing particulates from inflowing hydrocarbon fluids. Generally, a completion having a plurality of sand screen joints is deployed downhole in a wellbore and a gravel pack is formed around the completion. In some applications, shunt systems are used to facilitate distribution of the gravel pack. As an example, an open hole shunted gravel pack screen system may be configured with two transport tubes and two packing tubes in a 2×2 shunt system. Such a system effectively has two independent gravel packing systems in which each transport tube operates independently of the other and each transport tube has a dedicated packing tube along each screen joint. However, if one of the independent transport tubes becomes inoperable, the functionality of half the system is lost, and this increases the risk of an incomplete gravel pack.

[0003] Attempts have been made to limit this risk by commingling the transport slurry where the slurry is exposed to both the transport tubes and packing tubes along each sand screen joint. Such systems utilize concentric shunt systems having annular commingling volumes, which accommodate this mixing at the interface between transport tubes and packing tubes. However, the commingling of slurry at this interface between transport tubes and packing tubes may be undesirable in a variety of applications.

SUMMARY

[0004] In general, a system and methodology are provided for facilitating gravel packing along a borehole. According to an embodiment, a shunt system is positioned along a sand screen system. The shunt system comprises a plurality of transport tubes and a plurality of packing tubes. A manifold is coupled to the plurality of transport tubes and to the plurality of packing tubes at a corresponding sand screen joint of the sand screen system. The manifold serves to separate a portion of the gravel slurry flowing through the plurality of transport tubes and to direct the portion into the corresponding packing tubes. Additionally, a commingler is positioned along the plurality of transport tubes at a location separate from the manifold. The commingler has an internal chamber where gravel slurry is received from uphole transport tube sections and is commingled before flowing into downhole transport tube sections.

[0005] However, many modifications are possible without materially departing from the teachings of this disclosure. Accordingly, such modifications are intended to be included within the scope of this disclosure as defined in the claims.

BRIEF DESCRIPTION OF THE DRAWINGS

[0006] Certain embodiments of the disclosure will hereafter be described with reference to the accompanying drawings, wherein like reference numerals denote like elements. It should be understood, however, that the accompanying figures illustrate the various implementations described herein and are not meant to limit the scope of various technologies described herein, and:

[0007] FIG. **1** is an orthogonal view of a well system having a sand screen system combined with a shunt system, according to an embodiment of the disclosure;

[0008] FIG. **2** is an illustration similar to that of FIG. **1** but showing cutaway portions, according to an embodiment of the disclosure;

[0009] FIG. **3** is an illustration of a portion of the well system showing an example of a commingler disposed along transport tubes, according to an embodiment of the disclosure;

[0010] FIG. **4** is a schematic illustration of a sand screen system having a plurality of sand screen joints combined with an example of a shunt system, according to an embodiment of the disclosure;

[0011] FIG. **5** is a schematic illustration of an example of a manifold combined with a commingler, according to an embodiment of the disclosure;

[0012] FIG. **6** is a schematic illustration of a sand screen system having a plurality of sand screen joints combined with another example of a shunt system, according to an embodiment of the disclosure;

[0013] FIG. **7** is a schematic illustration of another example of a shunt system, according to an embodiment of the disclosure;

[0014] FIG. **8** is a schematic illustration of another example of a shunt system, according to an embodiment of the disclosure;

[0015] FIG. **9** is a schematic illustration of a sand screen system having a plurality of sand screen joints combined with another example of a shunt system, according to an embodiment of the disclosure;

[0016] FIG. **10** is a schematic illustration of an example of a manifold combined with a dual commingler, according to an embodiment of the disclosure;

[0017] FIG. **11**A is an orthogonal view of a well system having a sand screen system combined with a shunt system, according to another embodiment of the disclosure; and

[0018] FIG. **11**B is a comparison of jumper tubes shown in the system of FIG. **1** and a conjoined commingled jumper shown in the system of FIG. **11**A, according to one or more embodiments of the present disclosure.

DETAILED DESCRIPTION

[0019] In the following description, numerous details are set forth to provide an understanding of some embodiments of the present disclosure. However, it will be understood by those of ordinary skill in the art that the system and/or methodology may be practiced without these details and that numerous variations or modifications from the described embodiments may be possible.

[0020] The disclosure herein generally involves a system and methodology to facilitate formation of gravel packs in wellbores and thus the subsequent improved production of well fluids. According to an embodiment, a system and methodology are provided for facilitating gravel packing along a borehole. A sand screen system may be constructed with a plurality of sand screen joints having screens or filters for filtering inflowing production fluid during production of the well fluids. To facilitate the gravel packing operation, a shunt system is positioned along the sand screen system.

[0021] The shunt system may comprise a plurality of transport tubes and a plurality of packing tubes. A manifold is coupled to the plurality of transport tubes and to the plurality of packing tubes at a corresponding sand screen joint of the sand screen system. The manifold serves to separate a portion of the gravel slurry flowing through the plurality of transport tubes and to direct the portion into the corresponding packing tubes. In some embodiments, a manifold may be positioned along each sand screen joint such that the corresponding packing tubes are able to ensure proper gravel packing along the annulus surrounding each sand screen joint. Additionally, a commingler is positioned along the plurality of transport tubes at a location separate from the manifold. The commingler has an internal chamber where gravel slurry is received from uphole transport tube sections and is commingled before flowing into downhole transport tube sections. By way of example, at least one commingler may be positioned along each sand screen joint. In some embodiments, the manifold and the commingler are positioned at opposite ends of each sand screen joint.

[0022] In various applications, the commingler is positioned to commingle gravel slurry received from two or more transport tube sections without interfacing with the packing tubes. The commingler(s) may be used with a variety of shunt systems to facilitate commingling of the gravel slurry at a location separate from the manifold. By way of example, the commingler(s) may be used with 2×2 shunt systems, 3×2 shunt systems, 4×2 shunt systems, or other configurations of shunt systems. The overall configuration enables a reduction of pumping pressures and a reduction in carrier fluid leak-off during gravel packing operations.

[0023] Referring generally to FIGS. **1** and **2**, an embodiment of a well system **30** is illustrated. The well system **30** may be deployed in a variety of boreholes **32**, e.g. wellbores. According to the illustrated embodiment, the well system **30** comprises a sand screen system **34** having a plurality of sand screen joints **36**. Depending on the application, the sand screen joints **36** may be constructed in a variety of configurations. By way of example, each sand screen joint **36** may comprise a base pipe **38** having appropriate perforations and/or inflow control devices through which production fluid may flow to an interior of the base pipe **38** during production operations. It should be noted that the perforations and/or inflow control devices also may be used to facilitate the return of carrier fluid from the gravel slurry during gravel packing operations.

[0024] Each sand screen joint **36** also may comprise a filter **40**, e.g. a sand screen, positioned around each base pipe **38** to filter particulates from the inflowing well fluids before the well fluids pass through the perforations/inflow control devices of the base pipe **38**. In some embodiments, a shroud **42** may be positioned around the filter **40** along each sand screen joint **36**. Each shroud **42** also contains perforations **44** to accommodate fluid flow therethrough. Sequential sand screen joints **36** may be connected together via a suitable coupler **46**, e.g. a box and pin end style connection.

[0025] In the embodiment illustrated, the well system **30** further comprises a shunt system **48** positioned along the sand screen system **34**. By way of example, the shunt system **48** may comprise a plurality of transport tubes **50** routed along each sand screen joint **36**. The transport tubes **50** of sequential sand screen joints **36** may be coupled together in fluid communication via, for example, jumper tubes **52**. At least portions of the shunt system **48** may be located radially between each filter **40** and each corresponding shroud **42**.

[0026] The shunt system **48** also comprises a plurality of packing tubes **54** which may be disposed along, for example, each sand screen joint **36** to deliver a portion of the gravel slurry to the annulus surrounding the corresponding sand screen joint **36**. As a gravel slurry is flowed along the transport tubes **50**, a portion of that gravel slurry may be directed from the transport tubes **50** and into the corresponding packing tubes **54** via a manifold **56**.

[0027] With additional reference to FIG. **3**, the shunt system **48** further comprises a commingler **58** positioned along the plurality of transport tubes **50** at a location separate from the manifold **56**. The commingler **58** has an internal chamber **60** where gravel slurry received from uphole transport tube sections **62** (of the plurality of transport tubes **50**) is commingled before flowing into downhole transport tube sections **64** (of the plurality of transport tubes **50**). The internal chamber **60** is placed in fluid communication with uphole transport tube sections **62** via inlets **66** and with downhole transport tube sections **64** via outlets **68**. The internal chamber **60** provides a cavity for bringing together flow of gravel slurry from the two or more transport tubes **50** and for mixing the gravel slurry flows before redistributing the gravel slurry downstream through the commingler outlets **68**. By way of example, the commingler **58** and the internal chamber **60** may be positioned on one side of the sand screen joint **36** rather than being constructed as an annular volume encircling the sand screen joint **36**.

[0028] Depending on the application, the commingler **58** may be positioned at a variety of locations along the corresponding sand screen joint **36**. In the example illustrated, however, the commingler **58** is positioned generally on the pin-end of the corresponding sand screen joint **36**. As further illustrated schematically in FIG. **4**, the commingler **58** may be positioned at the pin-end of each sand screen joint **36** so as to deliver commingled gravel slurry to the next sequential manifold **56** located on the next sequential sand screen joint **36**.

[0029] In this example, the shunt system **48** comprises at least one manifold **56** and at least one commingler **58** located along each corresponding sand screen joint **36**. The packing tubes **54** extend from the corresponding manifold **56** and are routed along the corresponding sand screen joint **36** to ensure delivery of gravel slurry along the surrounding annulus. As further illustrated in FIG. **5**, each manifold **56** serves to separate a portion of the gravel slurry into the corresponding packing tubes **54** while directing the remainder of the gravel slurry downstream to the next sequential commingler **58**.

[0030] It should be noted that addition of the commingler **58** enables the addition of one or more transport tubes **50** so as to reduce the pumping pressure utilized for a given gravel pack distance. As further illustrated in FIG. **5**, the additional or secondary transport tube **50** (or additional tubes **50**) is not coupled with a packing tube **54** but instead directly passes through the manifold **56** via a pass through **70**. In this example, the three transport tubes **50** direct their gravel slurry into the next sequential commingler **58** for commingling within internal chamber **60**.

[0031] By adding one secondary transport tube **50**, as illustrated in FIGS. **5** and **6**, the shunt system **48** may be considered a 3×2 shunt system while the addition of two secondary transport tubes **50** to the 2×2 system may be considered a 4×2 shunt system. Other numbers of additional transport tubes **50** also can be added according to the parameters of a given system and/or application. In addition to reducing pumping pressure, the additional transport tubes **50** in combination with the location of the commingler **58** can greatly reduce leak-off of carrier fluid during a gravel packing operation.

[0032] Gravel slurry is generally a combination of proppant and carrier fluid; and leak-off refers to the loss of carrier fluid to the wellbore annulus without a corresponding loss of proppant. The result is an undesirable increase in proppant concentration within the gravel slurry. Leak-off occurs where nozzles **72** of the packing tubes **54** communicate to the wellbore annulus (see FIG. **7**).

[0033] In a 2×2 shunt system, the distance from the manifold **56** to the first packing tube nozzle **72** is the shortest distance for leak-off. Once the annulus is gravel packed around a given sand screen joint **36**, the proppant will pack the inside of the corresponding packing tubes **54** back to the manifold **56**, thus creating resistance to leak-off. However, there is a limit to the distance downstream of the manifold **56** that the first packing tube nozzle **72** can be placed to achieve a desired gravel pack between the first packing tube nozzle **72** and the next closest nozzle **72** of the previous uphole sand screen joint **36**. The leak-off distance for the additional transport tube(s) **50** (e.g. the middle transport tube **50** labeled transport tube #3 in FIG. **7**) is equivalent to the distance between the first packing tube nozzle **72** and the manifold **56** plus the distance from the manifold **56** to the corresponding commingler **58**.

[0034] It should be noted the corresponding commingler **58** may be located above the manifold **56** on, for example, the next sequential uphole sand screen joint **36**, as illustrated in FIG. **7**. In other embodiments, however, the manifold **56** may be located above the corresponding commingler **58**, as illustrated in FIG. **8**. Accordingly, the maximum leak-off distance achievable is one half the length of a sand screen joint **36** plus the distance to the first packing tube nozzle **72**. It should be noted that throughout this description the term "above" refers to a relative position uphole and the term "below" refers to a relative position downhole. In one or more embodiments of the present disclosure, the proximity of the commingler **58** to the manifold **56** may exhibit maximum leak-off performance if the commingler **58** is located approximately midway between two manifolds **56** of adjacent screen joints **36**.

[0035] According to an example, a sand screen joint **36** may be 38 feet in length and a first nozzle distance may be 6 feet. In this scenario, a maximum leak-off distance for the middle transport tube **50** (tube #3) would be 38/2+6=25 feet. This increased leak-off resistance for the additional/secondary transport tubes greatly improves the system reliability especially for extended reach gravel packs, e.g. gravel packs greater than 6000 feet or even greater than 10000 feet. It should be noted the distances and sizes used in this example are provided merely for purposes of explanation and the actual distances and sizes can vary substantially.

[0036] Referring generally to FIGS. **9** and **10**, another embodiment of well system **30** is illustrated. In this embodiment, the shunt system **48** is structured as a 2×2×2 shunt system, which is accomplished by installing two commingling volumes in the form of a dual commingler **74** having two comminglers **58**. The dual commingler **74** may be located at a distance upstream or downstream of a corresponding manifold **56**, e.g. at some distance away from the interface between the transport tubes **50** and the packing tubes **54**.

[0037] The embodiment further utilizes an additional (secondary) transport tube **50** alongside each of the transport tubes **50** that would exist in a 2×2 shunt system configuration. The dual commingler **74** creates two independent gravel pack pathways and provides a secondary transport tube **50** to each primary transport tube **50**. In the illustrated arrangement, the secondary transport tube **50** has a sufficiently long leak-off path to eliminate leak-off concern, thus providing an especially useful configuration for use in extended reach gravel pack applications.

[0038] In the example illustrated, each primary transport tube **50** is coupled with a corresponding packing tube **54** while each secondary transport tube **50** passes through the manifold **56** to the corresponding commingler **58** of the dual commingler **74**. In other words, each primary transport tube **50** and its corresponding secondary transport tube **50** is placed in fluid communication with one of the comminglers **50** of the dual commingler **74** as illustrated. The secondary transport tubes **50** effectively provide additional transport tubes with long leak-of distances to ensure that two transport tubes **50** always communicate to a toe of the well.

[0039] Each commingler **50** receives gravel slurry flow from one of the primary and one of the secondary transport tubes **50** and redistributes the gravel slurry downstream into the same two transport tubes **50**. Effectively, each commingler **58** of the dual commingler **74** contributes to reducing pumping pressure during gravel packing through the shunt system **48** while homogenizing the gravel slurry in the corresponding, e.g. partnered, transport tubes **50**. If plugging occurs in a primary transport tube **50**, each commingler **58** is able to help reestablish flow of gravel slurry downstream of the plug in the blocked transport tube **50**.

[0040] Depending on the parameters of a given well application, the components and configuration of the sand screen system **34** may vary. For example, the sand screen system **34** may utilize different numbers of sand screen joints **36** connected sequentially along various types of boreholes, e.g. horizontal or otherwise deviated wellbores. Each sand screen joint **36** may utilize different types of filters, flow control devices, shrouds, and/or other components. Similarly, the shunt system **48** may comprise transport tubes **50** and packing tubes **54** of various sizes and numbers. The manifolds **56** and comminglers **58** also may be utilized along the shunt system **48** in various patterns and arrangements. The size and configuration of each manifold **56** and each commingler **58** also may vary according to the parameters of a given gravel packing and/or production operation. In some well applications, the manifold **56** and/or commingler **58** may be located on various other components such as on an intermediate pup joint located between sand screen joints. Additionally, shunt system components may be located on some sand screen joints, e.g. every other sand screen joint. For example, a commingler or comminglers **58** may be spaced out along the shunt system **48**, e.g. placed on every other sand screen joint **36**.

[0041] Referring now to FIG. **11**A, an orthogonal view of a well system **30** having a sand screen system **34** combined with a shunt system **48**, according to one or more embodiments of the present disclosure is shown. As specifically shown in FIG. **11**A, the commingler **58** may be integrated into a conjoined commingled jumper **76** of the shunt system **48**, according to one or more embodiments of the present disclosure. As shown in FIG. **11**A, transport tubes **50** of sequential sand screen joints **36** may be coupled together in fluid communication via the conjoined commingled jumper **76**, which includes a commingler **58**, as previously described, integrated with two jumper tubes **52**, according to one or more embodiments of the present disclosure. Further, for the sake of clarity, FIG. **11**B shows a comparison of a pair of jumper tubes **52** and the conjoined commingled jumper **76**, according to one or more embodiments of the present disclosure. As previously described, the pair of jumper tubes **52** may be implemented in embodiments of the present disclosure where the commingler **58** is built into the screen joint **36**, and the conjoined commingled jumper **76** may be implemented in embodiments of the present disclosure where the commingler **58** is built into the jumper tubes **52**. Advantageously, building the commingler **58** into the jumper tubes **52** via the conjoined commingled jumper **76** in accordance with one or more embodiments of the present disclosure provides a more affordable assembly than building the commingler **58** into the screen joint **36**. Further, one or more embodiments of the present disclosure that include a conjoined commingled jumper **76** in the sand screen system **34** enjoy a smaller footprint over embodiments of the present disclosure that include a commingler **58** built into the screen joint **36**. This smaller footprint may translate into more preferable storage and inventory management logistics.

[0042] Moreover, a commingler **58** may be sporadically placed in the sand screen system **34** in one or more embodiments of the present disclosure. For example, one or more sand screen joints **36** of the sand screen system **34** may not be associated with a commingler **58** at all (either in the sand screen joint **36** itself or in the associated jumper tubes **52**) in one or more embodiments of the present disclosure. Indeed, one or more comminglers **58** may be spaced along the well system **30** at every sand screen joint **36**, every couple of joints **36**, every few joints **36**, every several joints **36**, every 10 joints **36**, every 20 joints **36**, or one commingler **58** may be positioned per zone within the completion, or several comminglers **58** may be positioned within each zone of the completion, or any number of sporadic placements. All such embodiments are contemplated and are within the scope of the present disclosure.

[0043] Although a few embodiments of the disclosure have been described in detail above, those of ordinary skill in the art will readily appreciate that many modifications are possible without materially departing from the teachings of this disclosure. Accordingly, such modifications are intended to be included within the scope of this disclosure as defined in the claims.

What is claimed is:

1. A system for use in a well, comprising:

a sand screen system having a plurality of sand screen joints; and

a shunt system positioned along the sand screen system, the shunt system comprising:

a plurality of transport tubes;

a plurality of packing tubes;

a plurality of jumper tubes, which fluidly couple transport tubes of sequential sand screen joints of the plurality of sand screen joints together;

a manifold coupled to the plurality of transport tubes and to the plurality of packing tubes to separate a portion of a gravel slurry flowing through the plurality of transport tubes into the plurality of packing tubes; and

a commingler positioned along the plurality of transport tubes or the plurality of jumper tubes at a location separate from the manifold, the commingler having an internal chamber where gravel slurry, received from uphole transport tubes sections of the plurality of transport tubes, is commingled before flowing into downhole transport tubes sections of the plurality of transport tubes.

2. The system as recited in claim **1**, wherein the commingler is located uphole relative to the manifold.

3. The system as recited in claim **1**, wherein the manifold is located uphole relative to the commingler.

4. The system as recited in claim **1**, wherein the commingler is positioned along the plurality of transport tubes, and is located on a first sand screen joint of the plurality of sand screen joints, and the manifold is located on a second sand screen joint of the plurality of sand screen joints.

5. The system as recited in claim **1**, wherein the manifold comprises a plurality of manifolds with at least one manifold positioned on each sand screen joint.

6. The system as recited in claim **5**, wherein the commingler comprises a plurality of comminglers with at least one commingler positioned on at least one sand screen joint.

7. The system as recited in claim **6**, wherein a dual commingler is positioned along at least one sand screen joint.

8. The system as recited in claim **1**, wherein the shunt system further comprises a secondary transport tube which passes through the manifold.

9. The system as recited in claim **1**, wherein the shunt system further comprises a plurality of secondary transport tubes which pass through the manifold.

10. The system as recited in claim **1**, wherein the commingler is positioned along the plurality of jumper tubes in a conjoined commingled jumper.

11. A method, comprising:

positioning a shunt system along a sand screen system;

deploying the shunt system and the sand screen system into a borehole;

depositing a gravel slurry along the sand screen system via a plurality of packing tubes coupled with a plurality of gravel slurry transport tubes via a manifold; and

commingling gravel slurry, flowing through the plurality of gravel slurry transport tubes, within a commingler located along the sand screen system at a position separated from the manifold.

12. The method as recited in claim **11**, wherein commingling comprises commingling gravel slurry received from two gravel slurry transport tubes.

13. The method as recited in claim **11**, further comprising providing the sand screen system with a plurality of sand screen joints connected sequentially.

14. The method as recited in claim **13**, wherein positioning comprises positioning at least one manifold along each sand screen joint, and at least one commingler along at least one sand screen joint.

15. The method as recited in claim **14**, further comprising: providing the shunt system with additional transport tubes at each sand screen joint; and passing the additional transport tubes through the manifold at each sand screen joint without placing the additional transport tubes in fluid communication with the packing tubes.

16. The method as recited in claim **15**, wherein positioning comprises positioning two comminglers at each sand screen joint and connecting at least one gravel slurry transport tube and at least one additional transport tube to each commingler of the two comminglers.

17. The method as recited in claim **11**, further comprising arranging the shunt system as a 2×2 shunt system.

18. The method as recited in claim **11**, further comprising arranging the shunt system as a 3×2 shunt system.

19. The method as recited in claim **11**, further comprising arranging the shunt system as a 4×2 shunt system.

20. The method as recited in claim **11**, further comprising:
providing the sand screen system with a plurality of sand screen joints connected sequentially; and
providing the sand screen system with a plurality of jumper tubes, which fluidly couple the transport tubes of sequential sand screen joints together,
wherein positioning comprises positioning at least one commingler along the plurality of jumper tubes in a conjoined commingled jumper.

21. A system, comprising:
a shunt system for use in facilitating gravel packing of a wellbore, the shunt system comprising:
a plurality of transport tubes;
a plurality of packing tubes;
a manifold coupled to the plurality of transport tubes and to the plurality of packing tubes to provide an interface for separating a portion of a gravel slurry flowing through the plurality of transport tubes into the plurality of packing tubes; and
a commingler separated from the manifold and coupled with the plurality of transport tubes to provide commingling of gravel slurry, flowing along the plurality of transport tubes, independently of the interface for separating the portion of gravel slurry into the plurality of packing tubes.

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