A media transport device for use in shot peening, blast cleaning, granite cutting, and similar applications transports media from a storage hopper to a workpiece. The media transport device includes a source of compressed air, a supply hose connecting the compressed air source to a mixing chamber, and a blast hose connecting the mixing chamber to a nozzle dispensing the media onto a workpiece. The mixing chamber defines a flow path for the compressed air between the supply hose and the blast hose and includes an inlet portion connected to the supply hose, an outlet portion connected to the blast hose, and a curved dispensing portion conveying media from the storage hopper into the flow path obliquely with respect to the flow path so that laminar flow through the mixing chamber is not substantially disturbed. The inlet portion is of sufficient length to assure laminar flow of compressed air through the mixing chamber before the media is introduced into the flow stream, and the outlet portion includes a section tapering to a diameter substantially equal to the inner diameter of the blast hose.
media more easily mixes with the flow stream and is less likely to drop out of the flow stream and accumulate in the mixing chamber, as also illustrated in FIG. 1. By introducing the media obliquely, less disruption of the flow stream occurs, thus further assuring that flow through the mixing chamber remains laminar.

Because the flow through the mixing chamber 38 is laminar and because the media is mixed with the flow stream through the curved dispensing portion 42, the discontinuities in flow due to the turbulent flow of the prior art are minimized. However, it will be noted in FIG. 2 that a change in diameter of the flow path does occur between the outlet portion 46 and the blast hose 22. Accordingly, as shown in FIG. 3, to eliminate this change in diameter and any turbulence introduced thereby, an insert 48 (which is shown in detail in FIG. 4) is installed in the outlet portion 46 of the mixing chamber 38. The insert 48 includes a tapered section 50 which has an initial diameter substantially equal to the inner diameter of the outlet portion 46 and tapers inwardly, terminating in a constant diameter portion 52. The diameter of the constant diameter portion 52 is substantially the same as the inner diameter of the blast hose 22, which is attached to the outlet portion 46 by a sleeve 54, so that the inner diameter of the blast hose 22 is maintained in registry with the constant diameter portion 52 of the insert 48. Accordingly, since all abrupt changes in diameter have been eliminated, laminar flow, once established in the relatively long inlet portion 40 of mixing chamber 38, is maintained through the mixing zone where media is dropping through curved dispensing portion 42 is mixed with the flow stream, through the outlet portion 46, and into the blast hose 22.

The invention claimed is:

1. Media transport device for transporting media from a storage hopper to a workpiece comprising a source of compressed air, a supply hose connecting the compressed air source to a mixing chamber, a blast hose connecting the mixing chamber to a nozzle dispensing the media onto the workpiece, said mixing chamber defining a flow path for the compressed air between the supply hose and the blast hose and including an inlet portion connected to the supply hose, an outlet portion connected to the blast hose, and a curved dispensing portion connected with said storage hopper, said curved dispensing portion curving obliquely into said flow path from an orientation generally transverse to said flow path, whereby said curved dispensing portion curves from an orientation permitting media within the storage hopper to drop into and travel through said curved dispensing portion into said flow path until discharged from the curved dispensing portion into said flow path at an oblique angle with respect to the flow path to introduce media from the storage hopper into the flow path at an oblique angle with respect thereto whereby turbulence of compressed air communicated through said flow path caused by media introduced into the flow path is minimized.

2. Media transport device as claimed in claim 1, wherein said inlet portion has a length sufficient to assure laminar flow of compressed air through the inlet portion.

3. Media transport device as claimed in claim 2, wherein the length of the inlet portion is significantly longer than the diameter of the inlet portion.

4. Media transport device as claimed in claim 2, wherein the length of the inlet portion is at least about ten times the diameter of the inlet portion.

5. Media transport device as claimed in claim 1, wherein said outlet portion includes a tapered section terminating in a diameter substantially equal to the inner diameter of the blast hose.

6. Media transport device as claimed in claim 5, wherein said tapered section is defined on an insert mounted in the outlet portion.

7. Media transport device as claimed in claim 6, wherein the insert includes said tapered section, and a constant diameter section extending from the tapered section to said blast hose.

8. Media transport device as claimed in claim 5, wherein said tapered section registers with a constant diameter section, the diameter of said constant diameter section being substantially equal to the inner diameter of said blast hose.

9. Media transport device for transporting media from a storage hopper to a workpiece comprising a source of compressed air, a supply hose connecting the compressed air source to a mixing chamber, a blast hose connecting the mixing chamber to a nozzle dispensing the media onto the workpiece, said mixing chamber defining a flow path for the compressed air between the supply hose and the blast hose and including an inlet portion connected to the supply hose, an outlet portion connected to the blast hose, and a curved dispensing portion conveying media from said storage hopper into said flow path, said inlet portion being of sufficient length to assure laminar flow of compressed air through the mixing chamber before the media is introduced into the flow stream, said curved dispensing portion terminating at said mixing chamber for introducing said media obliquely with respect to said flow path so that the laminar flow through the mixing chamber is maintained.

10. Media transport device as claimed in claim 9, wherein the length of the inlet portion is significantly longer than the diameter of the inlet portion.

11. Media transport device as claimed in claim 10, wherein the length of the inlet portion is at least about ten times the diameter of the inlet portion.

12. Media transport device as claimed in claim 9, wherein said outlet portion includes a tapered section terminating in a diameter substantially equal to the inner diameter of the blast hose, whereby laminar flow is maintained through said outlet section and into said blast hose.

13. Media transport device as claimed in claim 12, wherein said tapered section registers with a constant diameter section, the diameter of said constant diameter section being substantially equal to the inner diameter of said blast hose.

14. Media transport device for transporting media from a storage hopper to a workpiece comprising a source of compressed air, a supply hose connecting the compressed air source to a mixing chamber, a blast hose connecting the mixing chamber to a nozzle dispensing the media onto the workpiece, said mixing chamber defining a flow path for the compressed air between the supply hose and the blast hose and including an inlet portion connected to the supply hose, an outlet portion connected to the blast hose, and a curved dispensing portion terminating at said mixing chamber conveying media from said storage hopper into said flow path, said inlet portion being of sufficient length to assure laminar flow of compressed air through the mixing chamber before the media is introduced into the flow stream, said outlet portion including a tapered section terminating in a diameter substantially equal to the inner diameter of said blast hose.
eter section, the diameter of said constant diameter section being substantially equal to the inner diameter of said blast hose.

16. Media transport device as claimed in claim 14, wherein said dispensing portion curves from a generally vertical orientation permitting media to drop from said storage hopper into the dispensing portion to an orientation disposed oblique to said flow path whereby media is dispensed into said flow stream obliquely thereto to thereby maintain substantially laminar flow through the mixing chamber.

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