Deciphering VC

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10:33 AM

VCLaw[ Cobordism[top_Smoothing, mid_Smoothing], Cobordism[mid_Smoothing, bot_Smoothing] ] :=
VCLaw[ Cobordism[top, mid], Cobordism[mid, bot] ] = Module[
{her, law1, law2, dots, dots1, dots2, dr1, dr2, to, h, g2},
{law1, law2} = {{}, {}};
decors = Times @@ Cases[{mid},
  Loop[m_] :> (AppendTo[law1, bdot[m] - mdot[m]]; AppendTo[law2, tdot[m] - mdot[m]]; mdot[m]),
  Infinity];
dots = Union[Last /@ DotRule[top, bot]];  
dots1 = Union[Last @ DotRule[top, mid] /. bdot - mdot];
dots2 = Union[Last @ DotRule[mid, bot] /. tdot - mdot];
dr = Flatten[Cases[EquivalenceClasses[Join[List @@@ dr1, List @@@ dr2]],
  l_List :> ((# - First[l]) & /@ Rest[l])];
decors *= Times @@ (Union[Last /@ dr] /. bdot - h)^2;  
decors *= Times @@ (Cases[mid, P[__][m_] :> mdot[m], Infinity] / dr / bdot - h);
decors /= Times @@ (Join[dots1, dots2, dots] / dr /. bdot - h);
decors = decors / h[m_]^g2_ :> (2bdot[m])^(g2/2);
decors *= Expand[Times @@ MapThread[If[#1 === #2, 1, #1 + #2] &, 
{dots, dots /. dr}] ];
law1 = Join[law1,
  DeleteCases[
Thread[to[dots1, dots1 /. dr]] / mdot - bdot,
   to[m_, m_] ] //. to -> Rule];
law2 = Join[law2,
  DeleteCases[
Thread[to[dots2, dots2 /. dr]],
   to[m_, m_] ] //. to -> Rule];
{lawn1, lawn2, decors}];

VC[a_, b_, c_] := VC[a, VC[b, c]];  
VC[Cobordism[top_Smoothing, mid_Smoothing, ds1 _], Cobordism[mid_Smoothing, bot_Smoothing, ds2 _]] := Module[
  {law1, law2, decor},
law1, law2, decor] = VCLaw[Cobordism[top, mid], Cobordism[mid, bot]];
Cobordism[top, bot, 
  Expand[decor*(ds1 /. law1)*(ds2 /. law2)] / (_mdot)^2 -> 1 / (_mdot -> 0)]
];